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THE UNIVERSITY OF ALBERTA

Trends in the Mortality of Middle-Aged and Elderly Canadians, 1951-81

by

Gloria Lauris

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF ARTS
IN
DEMOGRAPHY

DEPARTMENT OF SOCIOLOGY

EDMONTON, ALBERTA
SPRING, 1987

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Trends in the Mortality of Middle-Aged and Elderly Canadians, 1951-81 submitted by Gloria Lauris in partial fulfilment of the requirements for the degree of MASTER OF ARTS in DEMOGRAPHY.

....

Supervisor

....

N. Keating

Date April 6, 1987

To My Parents

ABSTRACT

This thesis examines general, cardiovascular and malignant neoplasm mortality of Canadians 35 and over, for the four Census years 1951, 1961, 1971, and 1981 by using a data base combining Vital Statistics and Census data. Thirteen hypotheses were developed and tested by means of descriptive rates and multivariate regression analyses. The overall theme of the thesis that mortality is affected by social life style factors (like smoking, drinking and diet), is supported. The thesis is based on the proposition that Canada's aging population accounts for an increase in chronic illness and premature death which in turn leads to increased demand for medical services.

The most significant results indicate support for: (1) Olshansky and Ault's (1986) theory of mortality compression, suggesting that Omran's (1971) theory of Epidemiological Transition is incomplete, as cardiovascular disease mortality has declined since 1961; (2) Waldron's (1976) and Gove and Hughes' (1979) theory of the 'masculine sex role' which posits the beginning of an erosion of women's gains in longevity in relation to men due to their adoption of stressful life styles (i.e., smoking and drinking); and (3) Gove's (1973) and Kobrin and Hendershot's (1977) 'protection of marriage' theory, which posits that the married status is associated with lower mortality for both sexes due to social integrative factors associated with marriage. Gove's (1973) theory of greater 'protection of marriage for males' in relation to females was disproven. It was found that in the case of both general and chronic mortality, that unmarried females (relative to married females) had higher mortality than unmarried males (relative to married males), illustrating that some unmarried females may have benefitted more from the married state (and thus, lower mortality) than unmarried men.

The thesis concludes by outlining some of the salient implications of an aging population and by suggesting future lines of inquiry in this area of social research.

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I. INTRODUCTION

During the past several years there has been an increased awareness of the medical problems of the aging population of Canada. This concern has mainly arisen due to the increasing proportion of the aged in the country, as well the higher prevalence of chronic illness found among them.

Mortality levels in demography are studied not only as a matter of policy but also as a contribution to an understanding of the causes and consequences of population trends. This thesis proposes to study the major causes of death of the Canadian middle-aged and elderly population with the intention of not only predicting future needs and services for this aging population, but also contributing further knowledge to the understanding of the specific health problems and mortality of these age groups.

In this chapter, relevant background demographic information of the aging population will be outlined, followed by a discussion of the major causes of death and their implications, and concluding with the objectives of this study.

A. Demographic Background

Aging as a Phenomenon

As of June 1, 1984, close to half of the estimated population of Canada was aged 35 and over. The population aged 60 and over was 1.6 million in 1950 (11% of the population), and 3.1 million in 1980 (13%). It is estimated that by the year 2000, the population aged 60 years and over in Canada will reach about 4.6 million (15%), and at least one Canadian in ten will be 65 and over (Statistics Canada, 1984:10 and 1977:35; National Council, 1982:255). People born during the period of the 'baby boom' (roughly 1947 to 1965) will reach the age of 65 between 2012 and 2030, causing a projected 'geronto boom' (Naus, 1980:35).

According to United Nations definition, Canada is an 'aged' nation. The United Nations uses proportion of the population aged 65 years and over as an index of aging. For instance, a population is classified as 'young' if the proportion is less than four percent, 'mature' if between four and eight percent, and 'aged' if this proportion is eight percent or over. Using this criterion, Canada has shifted from an early mature population in 1881 when 4.1 percent of its population was 65 years of age and over, to an aged population in 1971 when this group finally exceeded the eight percent level (Kalbach and McVey, 1971:173).

Another indicator of population aging is median age. The median age in Canada has been slowly increasing over time. For instance, the median age of the population 35+ was 53.1 in 1951 and 54.8 in 1981 (see Table B-20 in the Appendix for details).

Life Expectancy and Life Span

With the decline in infectious diseases, gains in average length of life since 1880 have, according to Samuel H. Preston, exceeded all the gains that had been made since prehistoric times (Preston, 1977:165). Still, life expectancy continues to increase. In Canada in 1951, the life expectancy at birth for males was 66.3 years and for females it was 70.8 years. By 1981 these figures respectively were 71.9 and 78.9 (Statistics Canada, 1982).

Although great gains have been made in life expectancy, the maximum life span has not been increased. James F. Fries calculates that the ideal average life span of 85 (with a distribution which includes 99 percent of individuals between the ages of 70 and 100) can be obtained but suggests a biological maximum exists in which the length of life is fixed (Fries, 1980:130, 1983:404). If graphed, the survival curve approaches a rectangular form which mathematically suggests that there is an eventual 'ceiling' to the length of life possible. Nathan Keyfitz's predictions are similar. He writes: "Even if all social, racial, and sex groups could be pulled up to the same level as the most favored, the overall expectation of life would not be more than 80 years" (Keyfitz, 1978:956). The maximum length of life has been mathematically determined through a Gompertz function which postulates that an organism dies when the stress magnitude exceeds the organism's maximum ability to compensate for it (Strehler and Mildvan, 1960:20). Death seems to increase as an exponential function of age with a doubling time of about eight years, thus people living to extreme years are few (Fries, 1980:131). L. Hayflick (1965, 1975) discovered that repeated subculturing of human fibroblasts eventually produced cells incapable of further division, and that the potential for the number of cell doublings was correlated with the longevity of species. This finding has been labelled the Hayflick 'limit' (Manton, 1982:190). B.L. Strehler, however, believes that the 'limit' is not nearly reached yet, due to a number of types of cells in the human body whose ability to reproduce is not defined by the Hayflick limit (Manton, 1982:190). Much yet needs to be learned about the aging process and its effect on the deterioration of body cells.

The Sex Ratio

Over the past century, female life expectancy has continued to grow relative to the male, and this has meant that the ratio of elderly females to elderly males has been increasing (Statistics Canada, 1977:35-36; Northcott, 1984:36). More recently, while there have been some variations, every province between 1971 and 1981 has shown an excess of elderly females relative to males (Northcott, 1984:36). Since 1961, females have been predominant in the population aged 65 and over (Stone and Fletcher, 1980:14). In 1981, there were 124 females per 100 males aged 65-79, and in the 80-and-over age group, the ratio was 184 to 100 (Statistics Canada, 1983:20). Recent projections assume an extended increase in the female predominance within the older population, and this pattern is particularly sharp in the population aged 75 and over, where females are projected to outnumber males by about two to one by the year 2001 (Stone and Fletcher, 1980:14).

Many factors may affect the sex mortality ratio. For instance, studies have shown that at more advanced ages, the processes of physical deterioration and lessening resistence to disease appear to proceed faster in men than in women for reasons that include the hypothesis that females may have an inherent biological superiority (Stone and Fletcher, 1980:16). Conversely, Preston and Weed's (1976) analysis of data for several countries concludes that social and economic factors associated with modern societies have been influential on the sex differential death rate. They suggest that the work patterns and life style (for example, insufficient exercise, obesity, alcohol consumption, and smoking), within the past century, and which until recently were mainly associated with men, have led to lesser declines in the death rates for males than for females from chronic and degenerative diseases (Stone and Fletcher, 1980:15-16).

In the future, we can likely expect, due to the differential in the sex ratio, a continuation of the increase in proportion and number of elderly women and of *old* elderly women. This will have important social and health care system implications (Chappell, 1982:206).

B. Causes of Death

Chronic and degenerative diseases are now responsible for almost 80 percent of all deaths and for an equally high fraction of cases of total disability (Fries, 1980:132). These chronic illnesses are widespread conditions which are believed to originate in early life with the probability of their occurence increasing with age (Fries, 1980:132). In particular, the leading causes of death for all ages in recent years in Canada (in fact, most Western industrialized nations) are diseases of the circulatory system, neoplasms, diseases of the respiratory system and diseases of the digestive system, as well as deaths due to violence. Three of the leading causes of death--malignant neoplasms, heart disease, and cerebrovascular diseases--currently account for three-quarters of all deaths to persons aged 85 and over (Rosenwaike et al., 1980:1066). Two of these three causes of death, cardiovascular (or heart) disease mortality and malignant neoplasm (or cancer) mortality, will be studied in further detail in this thesis.

Cardiovascular Disease

Ischaemic or coronary heart disease (chronic rhumatic heart disease) has been historically a predominantly male disease. It is a disease which was not greatly understood until Herrick in 1912 described the clinical features of obstruction of the coronary arteries. Since then, coronary heart disease has been reported with increasing frequency and is currently the leading cause of death in the developed countries for males and females in the 25-74 age range (Moriyama, 1983:288; Chronic Diseases, 1985, 6(2):35).

The initial increase in deaths due to cardiovascular disease had been due in part to the relatively successful control of infectious diseases, the rapid growth of population in the older age groups, and to improved diagnosis which has tended to reduce the number of deaths attributed to ill-defined and unknown causes. At young ages (i.e., under 25), where death from heart disease is not a very important component of the total death rate, the rapid decline in heart disease was likely due to decline in infectious diseases such as rheumatic fever, which resulted in reduced deaths from heart conditions (Crimmins, 1981:237). At older ages, increased survival rates from cardiovascular disease may also contribute to this decline. It is expected, however, that future reductions in mortality for Canada's population will be achieved very slowly compared to the rapid gains resulting from effective control of infectious and communicable diseases in the past.

It is difficult to attribute the recent decline in cardiovascular death rates to any one risk factor or set of factors, however social life style factors have been suggested as greatly responsible for this decline (Wing et al., 1986:1408). Changes in life style include reduction in cigarette smoking, reduction in the intake of animal fats, and increased leisure-time physical activity. Among these factors, smoking is most clearly linked to cardiovascular mortality (Crimmins, 1981:241). These changes in life style may have played some significant role in reducing the death rates from cardiovascular diseases, but they do not appear to have occured equally among all age, sex, and race groups that have experienced declines in cardiovascular mortality. Moreover, it is generally believed that life style changes may only affect mortality substantially after a certain time-lag (Crimmins, 1981:244).

Michael McCall (1980) suggests that when considering the phenomenon of cardiovascular disease in the light of human evolution, it is "not surprising to find that an animal adapted originally to the gathering of fruits, nuts and cereal and which probably obtained animal protein only at the price of severe physical exertion should develop metabolic disorders when confronted with an *ad lib* supply of nutrients which were scarce in its evolutionary history and that addictive habits such as cigarette smoking will have unwanted side effects" (p.522). P. Christian (1968), in his review of European and United States research on coronary risk similarly concluded that "sociological influences, habits and personality structure are all decisive for the development of coronary disease" (Jenkins, 1976:988).

Males have generally suffered higher death rates than females from ischaemic heart disease, however higher mortality among females is being reported for rheumatic and hypertensive heart disease in developed countries (Moriyama, 1983:283). Life style risk factors may well be involved in these increases.

Malignant Neoplasms

In the eighteenth and early nineteenth centuries, cancer was considered relatively unimportant, hereditary in origin, and an inevitable result of aging. Today, cancer is the cause of almost one-fourth of all deaths in industrial countries. It is the second leading cause of death in Canada, claiming, for instance, over 40,000 Canadians in 1981. Almost 40% of these deaths occured before retirement age and 68% before age 75 (Chronic Diseases, 1983, 4(1):1). Cancer is believed to be largely caused by exogenous factors such as environment, life style behaviour, and diet (Higginson, 1980:448).

Cancer, or malignant neoplasms, is a cause of death for which the trend across age groups has varied. This has occured because cancer is not one disease that takes one form and for which there is one prescribed treatment; rather it is believed to take many forms, having as many treatments. Cancer varies by age group, and techniques of diagnosis and treatment differ by site. Cancer is a relatively unimportant cause of death for those less than 25, but there is a steady upward trend in the cancer rate starting at about age 45. This may be due to a dose-response effect. For instance, the trend in lung cancer for an age group is largely determined by the trend in current and previous tobacco consumption, with a 20- to 30-year lag. Furthermore, it is estimated that more than 80 percent of all lung cancer could be prevented if people stopped smoking (Crimmins, 1981:247).

While lung cancer has been increasing in recent years, cancer of the digestive organs for both sexes, and breast and cervical cancer for women, have been decreasing in some age groups. Changes in cancers of the digestive organs can be related to changes in food consumption and methods of preservation and preparation (Crimmins, 1981:247). Decreases in breast and cervical cancer could likely be due to advanced screening tests which detect symptoms much earlier, which means earlier treatment and therapy, and thus greater chances of recovery. D.T. Wigle (1977) suggests however, that breast cancer may increase in the future because of the sharp decline in fertility since 1960. His study supports the hypothesis that early pregnancy protects against breast cancer (Moriyama, 1983:282).

Doll and Peto (1981) estimate that about 75 to 80 per cent of cancer in the United States might have been avoidable. In other words, extrinsic or exogenous factors may be responsible for much of the cancer incidence in a developed or modern society (Moriyama, 1983:284).

Natural versus Premature Death

To die of 'old age' is to die a natural death, a death which is a consequence of the aging process. Natural death has been defined as "the inevitable outcome of linear declines of function in vital organ systems" (Fries and Crapo, 1981:98), or death due to "senescent fraility" (Fries, 1983:400). It represents the point in life where even the smallest challenge to the body's system results in death (Weeks, 1984:266).

In contrast to natural death is premature death. Premature death is considered to be any death occuring to an individual prior to their calculated life expectancy, due to accident or disease (Keyfitz, 1977:496); Albeson et al., 1983:63; Ouellet et al., 1979:453; Fries, 1983:400).[1] Fries and Crapo (1981) write, "premature death results from a large, devastating challenge that cannot be overcome by the body's defenses, even though organ reserve and medical care may be adequate for smaller challenges. Accidents, overwhelming infections, metastatic cancer, and cardiovascular disease can all terminate life prematurely"

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[1] The age of 70 used to be considered the approximate expectation of life at birth, coincidently corresponding to the biblical decree of life expectation extending to three score and ten (Statistics Canada, 1974:28). This life expectancy is currently several years higher.

(p.98). Regardless of when it happens, any death but a natural one is an interruption of the aging process, and potential years of life are lost. Potential years of life lost (in 1978) due to heart disease was estimated to be 8.4 years, and lung cancer, 2.4 years (Ableson et al., 1983:65). If chronic disease eradication could be accomplished, Samuel H. Preston anticipates that the proportion of the population over age 65 would grow by 62% as a result of the elimination of cardiovascular disease and by 12% in the case of neoplasms (Preston, 1976:185).

Of those early deaths occuring at the prime ages of 35-64, they accounted for every third male death and every fourth female death in the Canadian population over the past couple of decades. A large proportion of those prime-age deaths were attributable to habit-related causes (e.g., smoking, excessive drinking, and dietary habits). Early deaths at ages 65 and over accounted for half of the deaths from such causes (Statistics Canada, 1978:235).

C. Implications for an Aging Population

The older population is not simply an aged version of the younger. Compared to those in the age group between 15 and 64, the population 65-69 years of age and over has, among other differences, a higher proportion of females and widows, less education, lower mobility, and greater economic dependency (Statistics Canada, 1977:35). A revised retirement income system will be needed for the task of coping with an increasingly high ratio of pension recipients to contributors. It is possible that there will be attempts or pressures to redefine the age at retirement. Since health and social service requirements for individuals change dramatically with age, accurate predictions of the changes in age distribution at advancing ages are especially important to social policy (Manton, 1982:183).

From an economic point of view, the excess mortality of older males, in particular, will generally imply a substantial cost in terms of lost productivity, particularly for those whose careers are well established by this stage (Lopez, 1983:53). An increase in the cost of appropriate health care will occur with the increase of chronic illness, especially of elderly women. The elderly use more medical services than any other adult group; the old elderly use more than the young elderly, and women use more than men (Chappell, 1982:207). This further will necessitate a corresponding increase in, and better utilization of, health resources, assuming that people will be just as unhealthy in the future. Training of medical personnel specialized in diseases of the aged will be necessary, and more institutions which deal with chronically ill patients will be needed. In an attempt to slow the aging process, individuals will likely be expected to take more and more responsibility for their own health through the monitoring of their own life style, diet and exercise.

Chronic illness, in its many forms, will likely be a major focus of health-oriented programs in the years to come. Increasing age among the elderly is associated with decreasing health in the form of chronic illness, a growing dependency on others, and an increased liklihood of institutionalization (Chappell, 1982:207). Any effort which is preventative, curative or educational, which helps to decrease major causes of death by chronic illness will help to make Canadian life longer, more fruitful, and comfortable. If indeed evidence illustrates that mortality is substantially affected by sociological factors rather than by only biological ones, it would appear that great gain in chronic disease mortality reduction and increases in life expectancy could be obtained through improved social and economic conditions for Canada's aging population.

D. Objectives of Thesis

The objectives of this thesis are:

1. to study the trends in mortality of aging Canadians over a 30-year period, 1951 to 1981;
2. to determine the extent to which various social demographic factors (i.e., increasing age, gender, marital status, and region) contribute to our understanding of the mortality of middle-aged and elderly Canadians;
3. to compare and contrast cardiovascular disease mortality with cancer mortality and general mortality in Canada's

aging population;

4. to substantiate earlier studies done on mortality in industrialized nations, and to provide a comprehensive and systematic analytical study of certain social and demographic factors which are believed to affect the mortality of aging Canadians; and
5. to explore general policy implications with regard to mortality, and to health services for the elderly arising from results of this study.

Following this chapter, Chapter 2 will outline the theoretical framework of the study and the hypotheses to be evaluated. Chapter 3 will describe the data and the methodology utilized; Chapter 4 will involve the descriptive analysis of the data through examining the cause-specific and general mortality rates; Chapter 5 will provide regression analysis of the data, and Chapter 6 will conclude with the overall results and implications along with suggestions for future research.

II. FRAMEWORK OF MORTALITY DIFFERENTIALS, AND HYPOTHESES

Although many factors may contribute to death, mortality shows significant variation in relation to certain characteristics. For instance, there appears to be a very close relation between age and risk of death; thus age is often considered to be the most important demographic variable in the analysis of mortality (Shryock et al., 1976:224). Other elements considered to be of primary importance to mortality are gender, marital status, and residence. These characteristics and their effect on general and cause-specific mortality will be discussed under the categories of demographic factors (age, gender), marital status composition effects, and regional effects. The emphasis will be on determining the relative importance of these sources of mortality over time in Canada, from 1951 to 1981, for the adult population aged 35 and over.

A. Demographic Factors

Age and gender (sex) influence society in important ways since society frequently assigns social roles and organizes people into groups on the basis of their age and sex (Weeks, 1981:178). In order to determine the extent to which age or sex influence mortality, in comparison to other variables like region or marital status, age and sex will need to be held constant (or controlled for) in the analysis. First, however, they must be examined separately in order to understand how they may specifically influence general and cause-specific mortality.

(1) Age

Aging in the Context of the Demographic Transition Theory

Canada has been described as being in the final stages of the Demographic Transition, illustrated by its low vital rates and increasing population of older Canadians. As the Baby Boom generation of 1945 to 1960 grows older, Canada will continue to experience an increase in the middle-aged and older members of the population. Increases of 57% and over have been made in the early middle-aged cohorts of those aged 35-39 between 1951 and 1981. The most dramatic increases have occured, however, in the numbers of the extreme elderly (i.e. ages 85 and above). An increase of 180% has occured for males in this category between the years of 1951 and 1981, and an increase of 337% has occured for females during the same years. This increase has been occuring in similar industrialized nations. The United States population, for instance, also had a rapid increase in the number of elderly people. According to demographer Samuel Preston, this is largely a result of the sharp reduction in the death rate among older people, a population already large due to the great number of babies born between 1890 and 1915. "As a result," he writes, "during the 1970's the elderly population of the U.S. increased at a higher rate than the total population of India" (Preston, 1984b:44). Decreasing fertility over time, would of course, also affect the rate of population aging.

From the point of view of the classical formulation of the demographic transition theory, the following hypothesis may be formulated:

H1: The Demographic Transition Theory predicts that Canada's aging population will grow while its death rate declines. To test this, the median age each year will be correlated with the death rate each year. In addition, the age-specific general mortality rates in each of the age categories should show a significant decline over time (from 1951 to 1981), while the actual population in each age group should be getting larger.

Age and Degenerative Disease

Epidemiologic Transition

One theory which explains the sharp reduction in the death rate among older people is offered by Abdel R. Omran, who writes convincingly of an 'Epidemiologic Transition' which parallels the Demographic Transition in the developed countries. The theory distinguishes three successive stages in the transition during which a long-term shift occurs in mortality and disease patterns whereby degenerative and man-made ailments displace pandemics of infectious diseases as the primary causes of death (Omran, 1971:510; Kitagawa, 1977:383). These three stages are distinguished as (1) the Age of Pestilence and Famine, (2) the Age of Receeding Pandemics, and (3) the Age of Degenerative and Man-Made Diseases (Omran, 1971:516-517). The theory also differentiates three basic models of epidemiologic transition which arise from variations in and consequences of population change. These are: (1) the classical or western model; (2) the accelerated model; and (3) the contemporary or delayed model. Most western European countries, he describes, would fall under the first model; Japan, the second model; and most developing countries, especially Chile or Sri Lanka, would be described best by the third model (Kitagawa, 1977:383).

Omran would likely describe Canada as falling under the description of model (1), the classical model.[1] In similar fashion to the Demographic Transition theory, this classical model describes the gradual, progressive transition from high mortality and fertility to low mortality and fertility that accompanied the process of modernization in most western European societies. Omran notes that socioeconomic factors were the primary determinants of this transition. These factors, he writes, were "augmented by the sanitary revolution in the late nineteenth century and by medical and public health progress in the twentieth century" (Omran, 1971:534). In the late phase of the classical transition (i.e. in the second and third decades of the twentieth century) degenerative and man-made diseases become the leading causes of mortality and morbidity (Omran, 1971:534).

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[1] Kalbach and McVey (1971) however, view the settlement of North America as a direct consequence of the onset of the European demographic transition, and that the transition was not identical of the pattern observed in Europe, due to a much harsher and less developed environment (p.23).

Modernization and Demographic Change

The reason for the secular decline of infectious diseases has been an area of some debate. Thomas McKeown and associates claim that the decline was due to causes in one or more of three classes: medical measures of preventing and treating disease in the individual, a spontaneous (or arbitrary) decline of mortality, and improvements in the environment such as a rising standard of living, improved nutrition, and better hygiene (McKeown et al., 1972:348). They express serious doubts that initial declines in mortality were due to either medical measures or a spontaneous decline in mortality, and they conclude that the reductions were likely due to results of improvements in the environment. These improvements, however, varied with the century. For instance, they believe that the reduction of mortality and rise of population in the eighteenth and early nineteenth centuries were probably due to a significant increase of food supplies, which began in the seventeenth century, and which preceeded industrialization. This suggested that the initial phase of population growth was not dependent upon industralization. From the nineteenth century the contribution of improved food supplies to the reduction of mortality was supported by other influences: a general increase in the standard of living, better hygiene, and specific preventative and therapeutic measures introduced progressively during the twentieth century (McKeown et al., 1972:382). For instance, in the twentieth century, due to improved nutrition, better living standards, sanitation, water sterilization, immunization and specific antibodies, acute infectious diseases such as tuberculosis, acute rheumatic fever, smallpox, diphtheria, and tetanus now cause less than 2 percent of the health problems that they caused in 1900 (Fries, 1980:132; Omran, 1971:520; Kalbach and McVey, 1979:87; Rosenwaike et al., 1980:1074).

These gradual improvements in health and living standards are some of the factors of what Donald Cowgill (1974) calls the 'modernization process' (p.128). He defines modernization as "a non-uniform process encompassing level of technology, degree of urbanization, rate of social change, and degree of Westernization" (Cowgill, 1974:124; Cowgill and Holmes, 1972:2). Specifically, there are four basic factors involved in this modernization theory: health technology, economic technology, urbanization, and education (p.141). Health technology in particular, he believes, has led to the control of various diseases (primarily infectious and acute diseases) which in turn has led to longevity and the general aging of the population (accounting for the increased chronic and degenerative diseases) (pp.129-130). This development in industrialized countries has produced an enormous reduction in death rates over time. As economic and health improvements continue, the death rates continue to decline.

Calvin Goldscheider (1971) forms a similar 'developmentalist' perspective, and he proposes that increases in the standard of living that accompany economic development are sufficient for mortality reduction (p.124). As well-being levels improve, however, behavioural factors (i.e. tobacco and cholesterol consumption) which can lead to chronic illness may increase (Weatherby et al., 1983:28).

In summary, infectious diseases have, over time, been eliminated as the major causes of death, due to the the Modernization process, as described by the Epidemiological Transition. As the population has aged, illustrated by the Demographic Transition formulation, degenerative and chronic diseases have increased so as to become the typically major causes of death in Canada as well as in other industrialized countries. By 1951 (the beginning of this study), the Demographic Transition was close to completion, as shown by the low crude birth and death rates by that point. The epidemiologic transition, however, was not completed, as illustrated by the still fluctuating crude death rates due to infectious diseases. By 1981, chronic diseases were still the major causes of death, but infectious diseases now accounted for low rates of death.

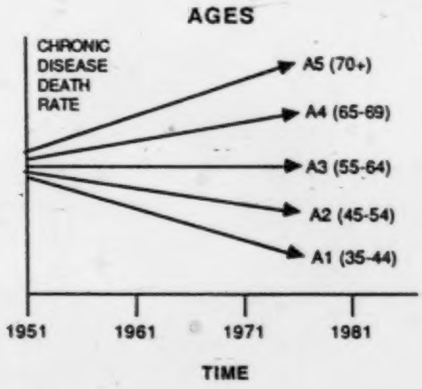
Chronic diseases, like cardiovascular disease and malignant neoplasms, generally appear as a person ages, since the diseases are believed to be due to losses in functional capacity and efficiency at the cellular, tissue, organ, and system levels. The degenerative breakdown of body cells is considered to be the ultimate reason for death in the human body. As men and women survive longer, however, the living population contains more people who are quite ill, but whose death has been deferred. James F. Fries, in an article entitled "Aging, Natural Death, and the Compression of Morbidity" (1980) discusses the possibility of compressing the period of senescence to near the end of the life span. He believes that if the rate of progression of chronic disease is decreased, then the date of passage through the clinical threshold is postponed and if sufficiently postponed, the symptomatic threshold may not be crossed during a lifetime and the disease is 'prevented' (p.133).

Postponement or prevention of certain illnesses is possible. Fries gives the example of eliminating cigarette smoking in delaying the onset of symptoms of emphysema and reducing the probability of lung cancer (p.133). Other preventative approaches to chronic illness like increased exercise, lower weight, and personal responsibility for health, he believes, are likely to be positive with regard to morbidity (and ultimately, mortality) (p.133). In societies like Canada, where chronic conditions are the main cause of death, a 'compensatory effect' between morbidity and mortality data usually appears, such that as a population's mortality profile improves, its health profile deteriorates (Verbrugge, 1983:233). Fries, however, would argue that increased morbidity in such a population need not be inevitable.

Hypotheses

H2: In keeping with the Epidemiologic Transition Theory, it is hypothesized that death rates due to cardiovascular disease and malignant neoplasms have been increasing in Canada from 1951 to 1981.

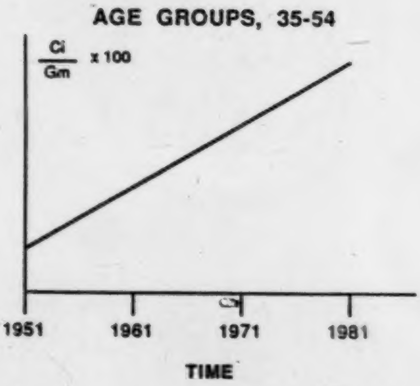
H3: Age is believed to have a significant and direct effect on mortality: the older the age, the higher the general mortality. James F. Fries (1980), however, believes that with increased health awareness and life style attitude changes (which accompany modernization), chronic illness can be 'prevented' to some degree and death 'postponed' until the oldest ages, when "everything comes apart at once and repair is impossible"(p.135). Elaborating on Fries' theory, Olshansky and Ault (1986) suggest the phenomenon of 'mortality' compression. In keeping with this theory of mortality compression, it is proposed that younger ages (under 65) will show reduced mortality from chronic diseases, and that this mortality is being postponed to older ages (65-69 and 70+). Therefore, over time, the death rate from these diseases should rise for the oldest groups while they fall for the younger groups.



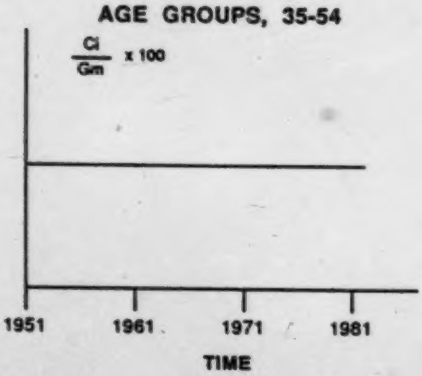
H4: The Modernization Theory and the Developmentalist Theory associate the decline in general mortality rates over time to the improved health technology and levels of living which accompany economic development. However, this same process while *lowering* the general death rate may similarly contribute to *increased* levels of mortality from cardiovascular disease and malignant neoplasms. At younger ages this increase may be due to negative life style changes due to Modernization (Weatherby et al., 1983:28), while at older ages it could be due to compressed mortality (Olshansky and Ault, 1986).

To test the hypothesis that life style affects chronic disease mortality, younger age categories (age 54 and under), will be examined. This is because it becomes increasingly difficult to determine whether it is life style or degeneration of the organism which contributes more to death from chronic diseases at the older ages (55+). Only the younger age groups will thus be examined for the purpose of testing this hypothesis, since life style changes alone are more readily interpretable and identifiable than are the separate and combined effect of life style *and* bodily degeneration on mortality. The extent to which life style may have an effect on mortality can be inferred through the use of a ratio between chronic and general death rates for these younger age groups. That is to say, if the ratio of the mortality rates of the chronic diseases (cardiovascular diseases, and malignant neoplasms) to the general death rate (as a general index of mortality) for the younger age groups over time, is:

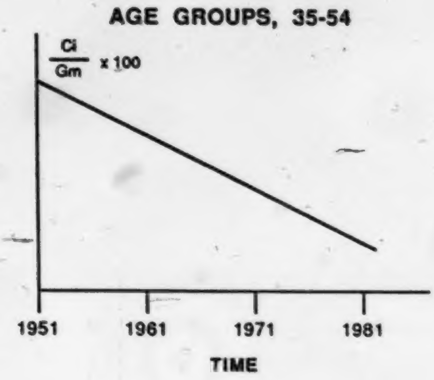
(a) increasing, then the hypothesis of life style influences as having a negative effect on chronic disease mortality would be supported, since death by chronic disease at these early ages would be more likely due to life style than to biological degeneration;



(b) constant, then the hypothesis would be rejected and possibly a biological aspect of chronic diseases may be supported, implying that life style may not significantly influence the rate of chronic disease mortality;



(c) decreasing, then the hypothesis would be rejected. If the chronic disease death rate was decreasing rapidly, then the theory that life style influences have a negative effect on chronic disease mortality would not be supported, and the converse would appear to be true: that is, that life style influences have a positive effect on chronic disease mortality.



(2) Gender Differences in Mortality

Nature, or Nurture?

"Although the relative longevity of the female sex was observed as early as 1662 by John Graunt," writes C.A. Nathanson, "it is only in the twentieth century that the general public has become aware of the gap in death rates between the sexes" (Nathanson, 1984:191). Twentieth century declines in mortality in developed countries have led to increased speculation on the role of social and environmental factors in mortality. Nathanson urges the continued study of sex differences in mortality, citing possible advantages: namely, comprehending the effects that gender roles have on mortality would lead toward a greater understanding of how social processes influence biological events, and as well, identification of the relevant gender role dimensions may aide prediction of how changes in these roles will likely influence health and mortality in the future (Nathanson, 1984:192). Since the sexes in Canada coexist within the same economic, social, and medical environment, persistent differences in their mortality rates are plausibly interpreted as reflecting differences in exogenous factors, or as reflecting innate biological differences (Preston, 1976:120).

In developed countries, female life expectancy presently exceeds that of males by 4-10 years, on average. At ages 55-64, the death rates for men are twice those for women (Nathanson, 1984:193). Richard F. Tomasson adds, "at no age in any industrial population is there a case where males have greater life expectancy than do females" (Tomasson, 1984:287). An excess male mortality index (i.e.; excess male mortality = risk of dying for males/risk of dying for females x 100), calculated from Statistics Canada, illustrates the increasing sex differential in mortality. In 1951, the index was 146.1 for the 35-60 age interval and 109.7 for the 60-85 age interval; for 1981 these figures were respectively 182.8 and 137.6 (Peron and Strohmenger, 1985:228).

Is this sex difference in mortality due to biology, or to sociological and environmental influences? There is no conclusive evidence, but there are numerous theories. For instance, Francis C. Madigan, in his famous study of Roman Catholic Brothers and Sisters, concludes: "(1) that biological factors are *more* important than sociocultural pressures and strains in relation to the differential sex death rates; and (2) that the greater sociocultural stresses associated with the male role in our society play only a small and unimportant part in producing the differentials between male and female death rates" (Madigan, 1955:209). Researchers since then, however, have questioned whether Madigan controlled for all relevant social and cultural factors.[3]

Other suggestions for differences in mortality are largely with regard to life style. For instance, Robert D. Retherford (1975) estimated that approximately 75 percent of the increase in sex differential in life expectancy (between the ages of 37 and 87) over the period from 1910 to 1962 could be accounted for by the effects of smoking (Gee and Veevers, 1983:84; Kitagawa, 1977:385). Ingrid Waldron (1976) suggests that the masculine sex role leads to both greater risk-taking and to greater experience of occupational stress, and that the prevalence of Type A characteristics (aggressive, workaholic tendencies) may partially account for men's excess heart disease mortality (Gove and Hughes, 1979:126; Nathanson, 1984:198).

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[3] See also I. Waldron (1983b) for a recent comprehensive discussion of biological factors in sex differences in mortality.

Most researchers, however, think that both biological and behavioural/environmental sets of variables are involved in the etiology of sex mortality differences. Cassel (1976) and Johnson (1977) have suggested that women's relatively favourable mortality may be attributable not to lower levels of the same risk factors that affect males but to different responses to the same risk factors or to a different set of strengths or vulnerabilities altogether. According to one of their reports,

> "mortality risks are substantially higher for men who are old, disabled, smokers, and unmarried. Women, on the other hand, have substantially higher relative risks for race, physical inactivity, few contacts with friends and relatives, and dissatisfaction with life" (Wingard, 1980:92). Personal health habits appear to affect male more than female mortality (Nathanson, 1984:210).

Women have been shown to have lower death rates than men, especially at the oldest ages. But while life expectation of females in the United States and Canada (and other developed countries) exceeds that of males, females' health while living appears worse. From illness survey data, females have higher incidence rates for acute conditions, and a higher percentage of them have one or more chronic conditions. When ill, females are more disabled than men. They spend more days of restricted activity and more days in bed than males for an illness. They also have more physician visits and more discharges from short stay hospitals (Verbrugge, 1976:275; Gove and Hughes, 1979:126).

Surely the sicker sex should have higher death rates. This is not the case. Lois M. Verbrugge proposes that female's higher morbidity but lower mortality than males is attributed to female's interviewing and illness behaviour, rather than to higher physical morbidity (Verbrugge, 1976:275). For instance, if health interview behaviour such as respondents' cooperation, their ability to recall illness episodes, and their verbal skills in describing illness differs for males and females, sex differences arise in illness rates which do not reflect different vulnerability to disease. There is no evidence that cooperation, recall, and verbal skills differ by sex. But the self-reporting versus proxy-reporting does. Proxy respondents systematically underreport morbidity of the absent person. Since the majority of proxy interviews are for absent males, a sex effect is introduced into the data (Verbrugge, 1976:291-2). With regard to female's illness behaviour, numerous social and psychological factors have been postulated to account for higher reports of illness by females compared to males. Females may have lower thresholds for perceiving discomfort, whether for social or biological reasons, and females may be more willing than males to report a perceived discomfort. Similarly, females may be more socialized to take curative measures when ill (Verbrugge, 1976:292).

Incorporating Verbrugge's postulates, Gove and Hughes (1979) suggest three plausible explanations for the sex differences in morbidity: (1) differences in the general willingness of men and women to report they are ill or overtly to react to an illness (i.e., act as if they are ill), (2) the greater ability of women to adopt the sick role due to characteristics of their role obligations, and (3) the possibility that the differences reflect real sex differences in illness. Gove and Hughes reject explanations (1) and (2) (and thereby also Verbrugge's conclusions), but support explanation (3) as they believe that women complain about their physical problems more than men because women have more to complain about (p.144).

Important changes in the sex structure of the population are taking place and imply specific needs in terms of facilities especially for women at older ages. Changes in the sex structure need to be taken into account in determining rates, and standardizing rates by age and sex will need to be done in order to determine the effect gender may have upon mortality.

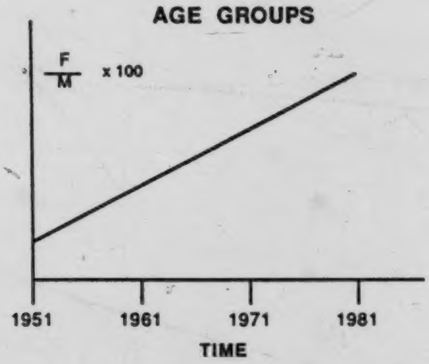
Hypotheses

H5: It has been frequently stated that males die at a higher rate than females at all ages, indicating that women are living longer than men (Tomasson, 1984:287; Atchley, 1972:130). This general demographic statement will be tested for its accuracy, and it is hypothesized that this will be the case for Canadian data.

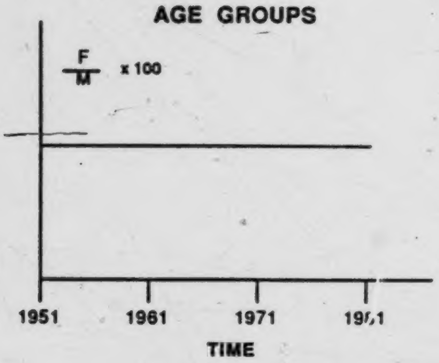
H6: The death rate for both men and women is decreasing. According to Goldscheider's Developmentalist Theory (1971), it is because improvements in health and living standards which accompany economic development are sufficient for mortality reduction (p.124). It is hypothesized that this trend of decreasing death rates for both sexes over time will be illustrated in Canada from 1951 to 1981.

H7: Differences in mortality between the sexes are hypothesized to be caused by life style factors. Greater stresses to the physiology system, such as increased smoking (Retherford, 1975) and occupational stress (Waldron, 1976), experienced more by men, may help to explain the higher male death rate. With women taking up more of the 'masculine sex role' (Gove and Hughes, 1979; Nathanson, 1984), it is hypothesized that over time, the death rates between the sexes (especially at the earlier ages, when women may be in the work force) will be narrowing, due to both modernization and life style changes, especially among women. Again, a ratio indicating the rate of mortality change between men and women can infer the extent to which life style affects mortality by gender. That is to say, if the ratio of the general death rate of women versus men, over time, is:

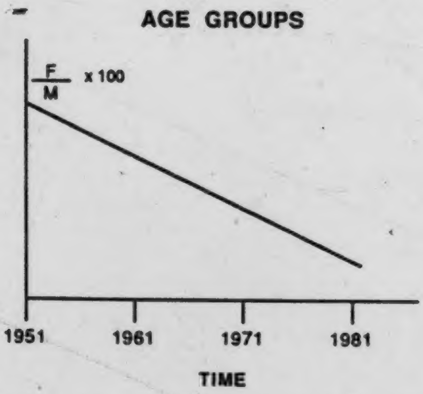
(a) increasing, then the hypothesis will be supported. Since women's rate of mortality is decreasing at a slower rate than men's, then an effect other than biological must be taking place which affects mortality. Furthermore, since life style habits are changing more dramatically for women than for men, they must have some effect on women's mortality; if the death rates rise (or decrease more slowly than men's), then this effect must indicate that, relative to men, deleterious factors are increasing women's chances of overall mortality;



(b) constant, then this would provide support for possibly a biological explanation of mortality differences between the sexes, indicating that genetic causes may significantly affect the rate of mortality rather than cultural causes (i.e., specifically, life style). The hypothesis of life style as significantly affecting mortality would then be rejected;



(c) decreasing, then the hypothesis would be rejected. If both rates were decreasing, but the rate of mortality for females was decreasing faster than the males', then the theory that life style has a greater deleterious influence on mortality for females than for males would be rejected.



Gender and Degenerative Disease

Cardiovascular Disease

Based on an international sample of mortality; Samuel H. Preston (1976) believes that 80% of the increase in sex differentials in mortality has been due to cardivoascular disease (p.146). Alan Lopez (1983) suggests that this figure is actually closer to 50% (p.77). Regardless, much of the increase in male excess mortality this century appears to have resulted from the widespread adoption of hazardous life styles by men and a general mismanagement of individual health. These results appear to be largely regulated by sex roles and social conventions governing the behaviour of males and females (Hetzel, 1983:276-7; Lopez, 1983:120). Further findings from Samuel H. Preston's data (1976) suggest that the consequences of modernization are different for the two sexes and relatively more positive for women than for men. He writes, "economic modernization appears to raise systematically the level of male mortality relative to a certain level of female mortality, and this effect is particularly important for cardiovascular diseases. Of the many standard components of economic modernization, nonagricultural employment and population concentration are the two having largest association with mortality differentials" (p.157). Preston further adds that living in a large city and nonagricultural work are likely proxies for unmeasured variables that represent particular features of the urban environment or characteristics of persons living therein (e.g., reduced exercise levels and increased cigarette smoking) (pp.157-8).

The 'masculine sex role' of greater risk taking and the greater experience of occupational stress, a theory which is supported by Gove and Hughes (1979), may also partially account for men's excess heart disease mortality.[4] Similarly, changes in personal behaviour resulting from industrialization and increased wealth is suspected of adversely affecting heart disease mortality in males, due to their increased average calorific intake (especially of animal fat) accompanied by a reduction in exercise due to mechanization of industry. This has led to a sedentary mode of life, with obesity often the result (Confrey and Goldstein, 1960:183-4; Moriyama, 1983:288-9; Hetzel, 1983:277; Lopez, 1983:117).

Women, on the other hand, have perhaps adapted themselves better than have men to the "atomization, rationalization and artificialities of modern life" (Bowerman, 1950:77). With the Modernization process, improvements in hygiene and medical technology has possibly indirectly operated to reduce female mortality from the cardiovascular diseases by aiding the elimination of the infectious diseases and complications of pregnancy frequently associated with them (Lopez, 1983:118). Female obesity decline occured with the emergence of the slim-figure fashion trend for women since the early 1920's, further decreasing their chances of cardiovascular disease.

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[4] The stress itself may only indirectly affect mortality. In response to stress, men in Western countries tend to drink alcohol, while women tend to talk with friends and professionals and take psychotropic drugs. There appears to be significantly greater health hazards associated with men's heavy alcohol use than with women's psychotropic drug use, so this sex difference in stress response contributes to men's higher mortality (Waldron, 1983a:1114; Verbrugge, 1983:225).

The recent and increasing numbers of women entering or re-entering the work force and in more positions of authority and stress, however, may increase the death rate from cardiovascular disease for women over time as they adopt more of the 'masculine sex role' and negative life styles (e.g., smoking and drinking).

Malignant Neoplasms

Alan Lopez (1983) suggests that about 20 percent of the differential mortality between the sexes is due to malignant neoplasms, over 70 percent of which reflects the excess mortality of males from cancer of the lung (p.77). Recent evidence has pointed to the higher cigarette consumption of males as the single most important determinant of their increasing excess mortality, acting both as an independent risk factor and synergistically with others (Lopez, 1983:118; Waldron, 1983a:1113; Hetzel, 1983:277). Using data from a number of Western countries, Samuel H. Preston (1970) has demonstrated that mortality trends for three diseases considered to be causally related to smoking--heart disease, lung cancer and bronchitis--have largely accounted for national trends in the increasing sex mortality differential since 1930 (Lopez, 1983:119; Moriyama, 1983:288-9). The American Cancer Society reported in 1979 that smoking was responsible for 83% of the existing cases of lung cancer among men and about 43% of cases among women (Cockerham, 1982:31). In fact, almost all the sex differences in trends from cancer in many countries can be ascribed to cancer of the lung (Preston, 1976:45). Cigarette smoking affects male mortality more than female (absolutely and proportionately) both because males more commonly indulge and because they appear to be more susceptible if they do (Preston, 1976:135). G.H. Miller (1980), investigated data from Amish rural communities in the United States where cigarette smoking was virtually nonexistant and he found no female longevity advantage (Miller and Gerstein, 1983:344). The implication, therefore, is that males have generally adapted less well to the more comprehensive process of modernization with its attendant behaviour changes and have adapted harmful life styles, like smoking, in response to the stress which has accompanied the modernization process (Lopez, 1983:119; Hetzel, 1983:277).

The increasing popularity of smoking among women is beginning to show a similar impact on female mortality patterns. This trend has been attributed to women smokers becoming older and their lungs beginning to reflect the damage. American women, for instance, did not begin smoking in earnest until after World War II due to the breakdown of previous social taboos forbidding such behaviour. Their rates of lung cancer are now matching the earlier rise among males. Lung cancer ranked eighth among cancer deaths for American women in 1961, but moved up to second by 1979. Consequently, a dose-response effect will likely see death rates for women rise in the future as more women adopt behaviour, namely smoking and drinking, that in the past was more characteristic of men (Cockerham, 1982:31; Burbank, 1972).

Regarding other major types of cancer, Alan Lopez (1983) suggests that the virtually exclusive female risk from breast cancer acts to reduce the male excess in mortality by some 47 deaths per 100,000 population, amounting to about 7 percent of the net total differential (p.77). Of the sites common to both sexes, male excess mortality from stomach cancer seems to account for a little less than 4 percent of the sex differential (p.77).[3]

That over one-half of the sex mortality differential among adults in developed countries can, on average, according to Lopez (1983) be attributed to the impact of two causes of death--ischaemic heart disease and cancer of the lung, the etiology of which is closely related to life style--strongly suggests that behavioural practises (primarily direct or passive cigarette smoking[4] and unwholesome dietary habits) underlie the comparitively poor health position of older males (p.85).

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[3] Cancer mortality in Canada during 1931 to 1974 was recently reviewed by Don Wigle (1978) who discovered that lung and prostate cancer was highest in men, breast and lung cancer in women, and cancer of the colon and rectum in both sexes (Wigle, 1978:113).

[4] Recent findings suggest that smoking explains over 90% of the variance in respiratory cancer mortality, and 50% of the variance in heart disease mortality (Kristein, 1984:317).

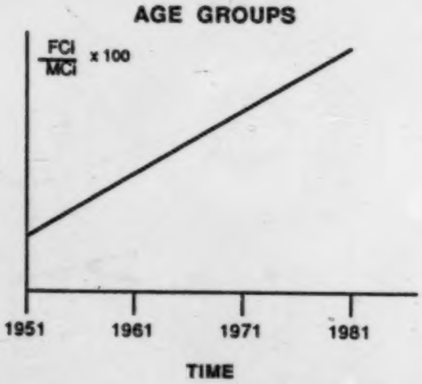
Hypotheses

H8: The 'masculine sex role' (Gove and Hughes, 1979; Waldron, 1976) and changes in lifestyle due to the Modernization process (Goldscheider, 1971) may well be responsible for the higher male death rate from chronic disease. In an attempt to indirectly test these theories with mortality due to chronic disease, it is hypothesized that male death rates from cardiovascular disease and from cancer are higher than female's, at all ages, but are changing over time due to convergence in life styles and sex roles.

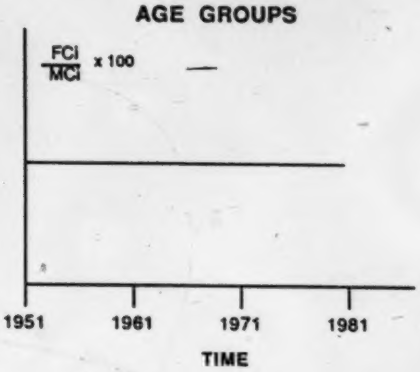
H9: As women adopt more of the 'masculine sex role' (see H8), it is hypothesized that the differences between the death rates of the chronic diseases (cardiovascular disease and cancer) will be decreasing between men and women over time.

Therefore, if the ratio of cardiovascular (or cancer) mortality between men and women over time is:

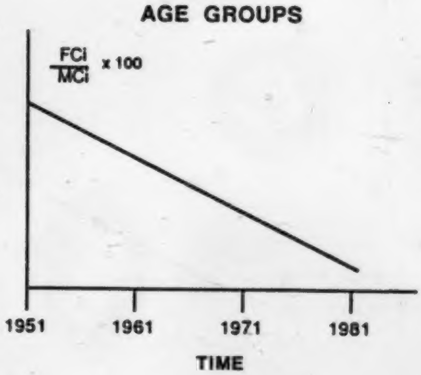
(a) increasing, then the hypothesis would be supported, implying that life style increases women's chances of mortality from chronic disease, while decreasing men's chances of mortality from chronic disease;



(b) constant, then the hypothesis that life style significantly affects mortality by chronic disease would be rejected and possibly a biological (or genetic) explanation of mortality differences by cardiovascular disease or cancer between men and women would be supported;



(c) decreasing, then the hypothesis would be rejected. If both rates were decreasing, but the rate of mortality by chronic disease was decreasing for females faster than it was for males, then the theory of life style having a greater negative influence on mortality for females over males would be rejected.



B. Marital Status Composition Effects

The Selection-Protection Argument

Over the past 30 years in Canada there have been, on average, greater numbers of married men than women in the same age categories. Conversely, the greater longevity of women, combined with the tendency of men to marry women younger than themselves, has resulted in an increase in the number and proportion of widowed and divorced women in the same age categories. For instance, according to the 1981 census, 75% of men aged 65 and over were married, compared to 39% of elderly females. Similarily, in 1971, half the women over 65 were widows while only 16% of men over 65 were widowed (Confrey and Goldstein, 1960:186; Statistics Canada, 1977:36 and 1983:66; Davis and van den Oever, 1982:500).

Over the past several decades it has been repeatedly observed that marital status is associated with level of mortality for both sexes. Death rates for most diseases have generally been found to vary from lowest to highest in the following order: married, single (or never married), widowed, and divorced. Insurance companies operate on the theory that married persons lead more settled and routine lives, and as a result tend to be less of a mortality risk than those not married and without family responsibilities[1] (Mausner and Bahn, 1974:56; Kalbach and McVey, 1979:80). Barry D. McPherson, in his *Aging as a Social Process* (1983) suggests that married couples have a different lifestyle from that of unattached persons: they live in better housing, they eat better, they take better care of themselves; in addition, a spouse is likely to make sure that prompt medical attention is received when illness occurs (p.90). Although better health of the married may be attributed in part to the psychologic and physical support provided by the spouse, the favourable health record may not be due solely to the effects of being married. Selective factors may also influence marital status; people who get married may be more robust physically or emotionally than those who remain single. Kobrin and Hendershot have developed a 'protection versus selection' hypothesis based on these factors (Mausner and Bahn, 1974:56; Kobrin and Hendershot, 1977:737).

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[1] Marriage is considered the most widespread form of stable community in our society (Eyer and Sterling, 1977:40).

The selection or protection arguments are probably not mutually exclusive, and both may contribute to mortality. But interpretations in the literature have generally focused on one or the other. Kobrin and Hendershot cite Gove's (1973) findings from sex role studies as supporting the protection explanation for the marital status differential in mortality. They suggest that protection from mental disorder and death might differ by sex because "married women, compared to married men, find their roles constricted and frustrating" and "single women are apt to have stronger ties to family and friends than single men". They conclude that women derive fewer of the benefits conferred by marriage and are exposed to less harm outside it (Kobrin and Hendershot, 1977:739). Historically, unmarried women were more likely to be living with relatives than unmarried men, but recent increases in extrafamilial living, which affect women disproportionally, have caused a decrease in marital status differential in mortality (Kobrin and Hendershot, 1977:739).

Being married seems to be more beneficial for men while the benefits for women do not appear to be as great. Durkheim once wrote:

> Speaking generally, we now have the cause of that antagonism of the sexes which prevents marriage favouring them equally: their interests are contrary; one needs restraint and the other liberty...Women can suffer more from marriage if it is unfavourable to her than she can benefit by it if it conforms to her interest. It is because she has less need of it (Durkheim, 1951:274-275).

Married women, however, seem to live longer than single women 65 years of age and over, and as well longer than women widowed and divorced under age 25. Research in the United States on mortality has suggested that the relationship between mortality and the marital status of males and females can be attributed, at least in part, to the characteristics of the marital statuses and their associated role behaviours and expectations (Kalbach and McVey, 1979:80). Gove and Hughes (1979) state that "when one controls for marital status, living arrangements, psychiatric symptoms, and nurturant role obligations, the health differences between men and women disappear (Gove and Hughes, 1979:126).

It is hoped that this analysis will help disentangle the effects of selection or protection of marriage in sex mortality differentiation. Any pattern of differentials should prove illuminating in this period of Canada's social history as patterns of living arrangements have been changing quickly. Unfortunately, a perfect test of this argument is not possible in this study, given the limitations of the data; we do not know what previous marriage, divorce, and re-marriage experience the people studied have had. Indirect ways, however, may be possible in order to study the selection or protection process of marriage, and these are proposed in the hypotheses in this section. It is valuable to study the relationship between marriage and the death rate in order to determine whether the pattern of Canadian mortality over the past 30 years is similar to results of other studies which found that those married generally have lower death rates than those not married.

Hypotheses

H10: According to insurance company claims, it is a demographic 'fact' that death rates vary with marital status, and that the rates vary from lowest to highest in the following order: married, single, widowed, and divorced (Kalbach and McVey, 1979:80). It is hypothesized that this 'fact' will be supported by Canadian data, and that it will hold true over time.

H11: Gove (1973) and Kobrin and Hendershot (1977) suggest there is a 'protection' element of marriage whereby those who are married should have ~~a lower death~~ death rate than those who are not married (i.e., single, widowed or divorced). To test this protection theory it is hypothesized that the general death rate for those married will be less than the general death rate of those who are not married, for any particular year. If the rate is equal, or if the death rate is greater for those married than those not married, then any residual would be due to factors other than a 'protection' factor, likely including a 'selection' component.

Thus,

$(GDR^{m} < GDR^{u})$ for any year ----> 'protection of marriage'

[where m=married and u=unmarried]

H12: Gove (1973) further suggests that men are more protected by the benefits of marriage than are women. It is hypothesized that if the difference between the general death rate of non-married men and married men is greater than the difference between the general death rate of non-married women and married women, then the 'protection' effect of marriage as affecting men more will be supported; however if it is less than or equal to the difference between the general death rate of married women and non-married women, then the protection argument of marriage for men will not be supported and any residue effect is caused by some other factor(s) possibly including a selection factor.

Thus,

$(\Delta GDR^{u-m}_{M} > \Delta GDR^{u-m}_{F})$ for any year ---> 'protection of marriage for men'

[where u-m=unmarried-married; M=males, and F=females]

Marital Status and Degenerative Disease

Marital condition appears to be related to certain causes of mortality. For instance, in the United States in 1940, mortality from the leading causes of death was found to be higher among single men than among married (with the exception of cancer of the genital organs); likewise, single women had lower mortality than married women for many causes of death, but widowed and divorced women had consistently higher mortality for all leading causes (Department of Economic and Social Affairs, 1973:141). In England and Wales in 1959, it was found that single persons tended to have higher mortality from chronic heart disease and cancer of the oesophagus, but lower mortality of the stomach. Single men tended to die more from cancer of the prostate, buccal cavity, pharynx and larynx. Single females tended to die of carcinoma of the breast, corpus uteri, and ovary; married females died more often of cancer of the cervix (Benjamin, 1965:42-3).

Life style appears to affect ones' chances of mortality from chronic diseases. For instance, early pregnancy appears to lower risk of breast cancer, but early sexual experience and multiple partners, however, appear to be decisive factors in cancer of the cervix (Mausner and Bahn, 1974:56). With changing life style due to increasing modernization, the type of disease affecting ones' chances of mortality also seems to change. For example, older single people tend to be more often malnurished and without the necessary emotional support--both important elements in recovery from disease (Atchley, 1972:131).

Hypothesis

H13: Assuming that the protection hypothesis of marriage is correct (Gove, 1973; Kobrin and Hendershot, 1977), it is hypothesized that fewer married men and women die from cardiovascular disease and cancer than non-married men and women.

C. Regional Effects

After more than 350 years of settlement, people in Canada have not by any means distributed themselves uniformly, either among or within the provinces. The highest numbers of middle-aged and the aged (like most of the other age groups) live in Ontario and Quebec, followed by British Columbia, then the Prairies, and lastly the Atlantic region (Stone and Fletcher, 1981:Chart 33).

Canadians experience variation in mortality depending upon geographic area and social groups. Region may be considered as playing a significant role, independent of social demographic factors, affecting the mortality experience of a given locality (Trovato and Halli, 1983:274). Residential differences in mortality may be biological-physiological in nature, or genetic, or the result of differences in the physical environment, differences in the socio-cultural environment, or differences in the interaction of two or more such variables (Sauer, 1974:128; Clifford and Brannon, 1985:223; Mykammal et al., 1984:17-28). A regional sub-culture may evolve over many decades. For example, statistics show that the average child in New Brunswick belongs to a larger family than those in most other provinces, lives in more crowded housing, has poorer medical and dental services, and is taught by less well-trained teachers. Not any of these differences is conclusive in itself, since it is debateable whether any one of them represents a serious environmental disadvantage. Yet, taken together, they are symptomatic of a general situation that is likely to handicap the individual in later life (Economic Council of Canada, 1977:12).

Differences in life expectancy by region may be influenced by differences in average levels of living, public health programs, and various social, political, and cultural factors (Kitagawa, 1977:382). Life expectancy is the greatest in the Western provinces followed usually by Ontario.[1] Quebec and Nova Scotia have the lowest life expectancy at birth although Quebecers and Nova Scotians spend an above-average share of their personal income on physicians services. Newfoundland, Prince Edward Island, and New Brunswick have attracted (or retained) relatively fewer doctors than the wealthy, urbanized provinces. Medical services appear to be more scarce in Newfoundland than in other provinces (Economic Council of Canada, 1977:57).

East-West comparisons likely involve regional disparities in urbanization and economic development as well (Kalbach and McVey, 1979:71-73). There are substantial differences among Canadian regions in the degree of urbanization. Only one hundred years ago, over three-quarters of Canada's working force was engaged in farming. Today, Canada's population is predominantly urban, and 95 per cent of all employment is in non-farm activities (Economic Council of Canada, 1977:62).

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[1] For both sexes together, quality-adjusted life expectancy in 1978 was 1.4 years greater in Ontario and the Prairies than in the Atlantic region, 3.2 years greater in Canada's three largest cities than in rural areas and small towns, and 7.7 years greater among persons from high-income families than from low-income families (Wilkins and Adams, 1983:1073).

Migration may also have an important influence on cause of death. With increased modernization of a country, migration (both internal and external) is a consequence of economic growth increases, increasing opportunities, urbanism, and industrialization, and thus can be considered a proxy measure for rapid social change (Goldscheider, 1971:72-73; Trovato, 1986a:208 and 1986b:343). Interprovincial migration is determined by distance and economic advantage. Yet, southern parts of Ontario and British Columbia have been destinations preferred by foreign immigrants and Canadian immigrants alike. The lure of Ontario and the West are apparently sufficient to offset the high cost of long-distance moving. Calvin Goldscheider (1971) writes that "migration always involves changes in other subsystems of society...migration may often be viewed as a link in the process of change, neither clearly as a determinant nor as a consequence...moreover, once mobility occurs, other subsystems are usually altered" (p.73). Migration may involve lesser or greater *cultural* changes, or broader *demographic* or *economic* changes (p.74). These changes often affect the homogeneity of a region or area, which in turn, may affect ones' chances of illness or death. For instance, with regard to *cultural* change, the rapid social change which often accompanies migration weakens normative consensus among members of the community in significant aspects of life. The more rapid the change, the greater the weakening of traditional values of familism, and the greater the emphasis on the develoment of an ideology of individualism (Trovato, 1986a:208). Alienation caused by the process may lead ultimately to suicide. An example of *demographic* changes produced by migration might be an unusually wholesome environment having a high death rate because it possesses relatively more elderly citizens, due to out-migration of the young (as often happens in Prince Edward Island, Saskatchewan and Manitoba), or in-migration of the old (such as with British Columbia). Inhabitants of areas which contain many single people (never married) generally tend to have higher death rates.[9] Furthermore, migration may cause *economic* changes: high unemployment rates for example, are thought to be correlated with high death rates (Orcutt et al., 1977:260,264; Economic Council of Canada, 1977:33-4).

Social indicators in housing, health, and education tend to confirm that Ontario, British Columbia, and Alberta enjoy a higher standard of living than other provinces, with the Atlantic region assuming the lowest standard of living (Economic Council of Canada, 1977:59-60). Yet, while the Atlantic region is a low-income area from which people (mostly the young) are migrating, it seems to enjoy the lowest rate of social disruption and stress to the extent that statistics on divorce, crime, and suicide are indicative of such things.[10] Frank Trovato attributes these results to the fact that the Atlantic provinces (as well as Manitoba and Saskatchewan) tend to be less developed than the more central areas of Canada. "Less developed areas," he writes, "are known to be more traditional and hence less likely to relinquish norms that encourage familism" (Trovato, 1986a:209). Similarily, high rates of out-migration may be an indication of regional poverty and regional underdevelopment (p.209). A traditional atmosphere and economic underdevelopment may contribute to a regions' lack of social disruption, which may ultimately affect ones' chances of mortality in that region.

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[9] Persons who are divorced or widowed also tend to migrate, bringing with them their high death rates (Stone, 1969:80).
[10] Symtoms of stress and social distruption must be interpreted with caution as they are influenced by many

It is difficult to say which has the greatest effect on mortality in a region: the environomental aspects of a region, the cultural aspects or life styles of people in a region, or stresses caused by life style changes due to migration (either in or out). Likely, all these factors contribute to ones' chances of dying in that region. If the factors responsible for insuring lower death rates could be identified and applied everywhere, then fewer deaths could occur each year. Unfortunately, when a number of competing factors may be involved in the consideration of a variable, these factors are usually closely interrelated which makes it difficult to determine separate influences of a

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''(cont'd) factors. The standards of law enforcement, for instance, differs regionally. Also divorce rates in predominantly Roman Catholic areas can be expected to differ from those in Protestant areas. Divorce rates are also influenced by marriage rates: low divorce rates may reflect a prevalence of common-law marriages rather than a state of marital bliss (Economic Council of Canada, 1977:59).

particular factor on any cause of death.

Given the extent of mortality differentials between regions, the need for examining regional effects is evident. The differentials are of sufficient magnitude as to be of interest not only to demographers and professionals in the area of health planning, but also to those concerned with the delivery of health services. The limited scope of this inquiry does not allow for the detailed quantitative examination of separate factors which may make up the 'regional' variable. Such an examination would be necessary in order to go beyond generalities. Thus 'regional effects' will be used as a control variable, representing a conglomerate of interrelated factors. Hypotheses regarding this variable will not be required.

III. METHODOLOGY

A. Operationalization of Hypotheses

A series of hypotheses, in Chapter 2, have been developed and their operationalizations were explicated as well. This study will evaluate the hypotheses for main effects between each variable and time. Main effects are additive influences of each variable on the death rate. Interaction effects (involving the multiplicative influence of time with each of the independent variables on the death rate) will be tested more indirectly through conditioning the variables on time. An appropriate methodology, to be explained later in this chapter, will be applied to decompose the amount of variance explained by the main and interaction terms in general and cause-specific mortality.

B. Data Description and Variables in the Analysis

The dependent variable (Y) is the death rate; the independent variables (X) are year, age, sex, marital status, region, and cause of death. Specific breakdown of variables and their rationale in this study will follow.

Dependent Variable

Mortality Rate. The chances of dying, as illustrated by the general and cause-specific death rate, make up the dependent variable. Vital Statistics data on mortality have been obtained from the Canadian Mortality Data Base, assembled by Statistics Canada. This information has been cross-classified with the independent variables, and rates determined through the aggregation of corresponding population data.

Population groups from published Census tabulations, broken down by the characteristics of the independent variables, were matched with the mortality cell frequencies in order to compute appropriate rates. The total population over all the time periods studied is 30,619,455 (see Table B-21 in the Appendix for a breakdown of the population characteristics).

Independent Variables

Year (or period). The time periods studied are 1951, 1961, 1971, and 1981. Selecting Census years ensures availability of data, while providing population bases for Vital Statistics mortality data. The earliest year, 1951, was chosen because information from Vital Statistics regarding cause of death (from the Canadian Mortality Data Base) is listed only as far back as 1950. The most recent period, 1981, is the latest Census year for which information is presently available.

Age. Age has been grouped into the following five categories for study: 35-44, 45-54, 55-64, 65-69, and 70+. These groupings minimize empty cells in 'low frequency' causes of death. The earliest age was chosen at age 35 as this is the approximate age at which chronic diseases begin to show prominance. The odd grouping at the older ages, i.e. 65-69 and 70+, is necessitated by the fixed age groupings in the Census population count in 1951. The 1951 Census thus establishes the basis (or, least common denominator) for the population grouping and age categories of the deceased for all subsequent years studied.

Gender, or Sex. In collapsing the data into groups of males and females, the mortality rate may be analyzed for gender effects.

Marital Status. Marital status data are most commonly grouped into the states of single, married, widowed, and divorced in the Vital Statistics publications. The data in this study follow this established grouping.

Region. The Canadian provinces with similar physical, economic and cultural characteristics are grouped into common regions. These are commonly grouped as the Atlantic, Quebec, Ontario, Prairies, and British Columbia regions. The Yukon and the Northwest Territories were not included as the frequency of deaths was not large enough to provide reliable results in the analysis.

Cause of Death. These are classified in accordance with the Ninth Revision of the International Classification of Diseases (ICD). (See Table B-22 in the Appendix for disease classifications by year.) Four major categories of death groupings were chosen: all deaths, cardiovascular disease mortality, malignant neoplasm mortality, and all other causes of death.

These categories were selected for three main reasons. **First**, since different ages often carry with them different causes of death, it is pertinent to choose those causes of death most relevant to older age groups. **Second**, chronic diseases are the leading causes of death in Canada, as discussed in Chapter 1. Thus, it is important to study them in the context of an aging society. Eileen M. Crimmins, in a study of the pattern of mortality decline in America from years 1940-1977, explains that she chose these (similar) categorial groups "because they combine diseases influenced by similar factors; and, they are categories that are major components of either the level or change in the death rate in some or all age groups" (Crimmins, 1981:233). **Third**, restriction of this study to four causes of death categories, and focusing primarily on the first three, allows for more thorough analysis of major causes of death than if a large number of varied but specific causes were attempted for analysis. The analysis of overall mortality should present a general picture of trends over the years, while providing a convenient index with which to compare cause-specific chronic death rates, which are the increasing by-product of an aging society.

The frequency of deaths (i.e., the number of cases) analyzed in this thesis is 511,422.[11] (See Table B-23 in the Appendix for a specific breakdown of the frequency of deaths by cause, region, gender, marital status, or age.)

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[11] Note: the actual number of deaths was 515,248, but causes for which information was missing were deleted. See the end of this chapter regarding elaboration of missing data.

C. The Study Design

This study is meant to be a form of historical analysis and it will take form in two major parts: descriptive and multivariate analysis.

Descriptive Analysis

The particular direction of this study is to examine the mortality experience of aging and aged Canadians from 1951 to 1981 by means of a *periodic* analysis. The method of periodic analysis involves making comparisons between rates of a particular manifestation, in this case death, in the age and sex groups of the population at each time period, and they are viewed in cross section at several points in time. Periodic analysis relates health phenomena prevailing at given periods to the environments prevailing at those periods. The causal assumption is of a current environment producing a current effect (Susser, 1973:82).

Using a specially designed data base made with the variables mentioned earlier and causes of death cross-classified with these variables obtained through the Canadian Mortality Data Base, a number of tables and figures will be made which will illustrate trends in the various age groups by utilizing the specific variables of year, sex, gender, region and mortality. Age- and sex-specific rates will be used, as well as standardized rates. This descriptive aspect of the study will be elaborated in Chapter 4.

Multivariate Analysis

This study uses multiple regression based on the premise of Ordinary Least Squares (OLS). Michael S. Lewis-Beck, in his text *Applied Regression* (1980), states that multiple regression is specifically useful in two ways: first, it offers a fuller explanation of the dependent variable, since few phenomena are products of a single cause; and second, the effect of a particular independent variable is made more certain as the possibility of distorting influences from other independent variables is removed (p.47).

The Least Squares assumption is that there is a linear relationship between two or more variables, and the purpose of regression is to try to fit the relationship of two or more variables in the data to a mathematical line in which the equation which best 'fits' this relationship is the line in which the sum of the squared vertical distances from this line to the points representing the rates is a minimum. This is done by minimizing the sum of the squares of the prediction errors (SSE):

$$SSE = \Sigma(Y-\hat{Y})^2.$$

In the general multiple regression equation, the dependent variable is seen as a linear function of more than one independent variable,

$$Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + \ldots + b_kX_k + e$$

where the subscript identifies the independent variables, *a* is a constant, *b* the slope of independent variable *X*, and *e* is an error term. The least squares equation could be represented graphically as a plane with a three-dimentional scatter of points. The location of the plane is dictated by the values of a_0, b_1 and b_2 which are given through the calculations of the equation (Lewis-Beck, 1980:48).

The interpretation of the partial slope, or partial regression coefficient, is as follows: b_k = the average change in Y associated with a unit change in X_k, when the other independent variables are held constant. Thus, the effect of X_k itself is freed of any distorting influences from the other independent variables. Holding constant involves statistical, rather than experimental, control. This will be done frequently through the analysis in Chapter 5.

Using this basic explanation of regression, two further adjustments must be made and noted. One is the use of a logarithmic transformation of the dependent variable, the other is the use of dummy variables.

Since multiple regression assumes linearity, and since the relationship between the dependent and independent variables is not a linear one, a transformation of the dependent variable is necessary. Two common ways to transform an equation are through adding a polynomial term, or through applying a logarithmic transformation to one of the variables. The scatterplots illustrated in the residuals of the trial equations suggested the logarithmic transformation would be appropriate. Thus, the logarithm of the dependent variable in the regression equation is taken:

$$\log(Y) = a_0 = b_1X_1 + b_2X_2 + b_3X_3 + \ldots + b_kX_k + e.$$

The logarithm works as a linearizing function.

Also, since none of the variables in this thesis are interval or continuous variables (assumed in multiple linear regression), but nominal variables, the variables are re-categorized as dichotomies, appropriate for least squares analysis. These dichotomies are known as 'dummy' variables, and the values 0 and 1 are typically assigned to them, with zero as the reference category. In a variable which has more than two categories, for instance marital status, which has four, one of the statuses is used as the reference (married, for instance) and compared in dichotomies with the other variables: e.g., married (0) and single (1), married (0) and widowed (1), and married (0) and divorced (1).

The SPSSx social statistics computer package is used for the analysis in Chapter 5. This uses the Least Squares algorithm to compute the parameters based on specified models or equations 'fitted' to the data. A 'significant' trend is one in which the probability of chance variation in the trend is less than .05 or .01. This is accomplished through computer generated 't-tests'.

Tests of Significance and Goodness of Fit

To assess the goodness of fit of a multiple regression equation, the R^2, referred to as the coefficient of multiple determination, is employed:

$$R^2 = \frac{\Sigma(\hat{Y}-\bar{Y})^2}{\Sigma(Y-\bar{Y})^2} = \frac{\text{regression(explained) sum of squares}}{\text{total sum of squares}}.$$

The R^2 in the equation indicates the proportion of variation in Y 'explained' by all the independent variables. It is naturally desirable to have a high R^2 as it implies a more complete explanation of the phenomena under study. But rather than continually entering variables primarily to enhance R^2, the analyst must be guided by theoretical considerations in deciding which variables to include for a parsimonious model (Lewis-Beck, 1980:52-53). The hypothesized models from Chapter 2 will be compared to the data to determine if they provide a 'good fit'.

D. Possible Sources of Error in the Study

There could be several sources of data error that will need to be taken into consideration. For instance, the cause of death analyzed per individual will be the primary cause of death on the death certificate. Since many deaths are caused by several interacting factors, ideally all of these causes (if known) should be listed. Since they will not all be listed, this will lead to underreporting of some of the causes of death.

Similarly, the quality of cause of death statistics is questionable in some cases as new revisions of the International Classification of Disease (ICD) manuals came out. Samuel H. Preston and associates (1972) in *Causes of Death: Life Tables for National Populations*, mention the major problems of accuracy and comparability in many of the categories. For instance, with regard to neoplasms, they write: "trends have been biased upward by the declining proportion of deaths assigned to 'ill-defined' and 'unknown' causes" (p.41). As to cardiovascular diseases, they comment, "declining proportions assigned to 'ill-defined' and 'unknown' causes probably resulted in a growth of the number of deaths in this category. There was a loss of about 2% of deaths at the Fifth Revision when 10 terms were transferred to chronic nephritis. Frequent association with other chronic conditions--nephritis, bronchitis, diabetes--makes death rates from this cause susceptible to national coding idiosyncracies" (Preston et al., 1972:41).

Other possible sources of error may arise from missing information regarding deaths in the data sets. For instance, for bodies found with no identification, marital status, cause of death, and even the correct age, cannot be listed with accuracy on the death certificate, although the death will be recorded for that year. In such cases where death has been listed, but missing information on characteristics exists, an imputation system is often devised in which to incorporate the data into the data set based on the categories they are likely to fall. For instance, maximum likelihood estimation (MLE) or iterative proportional fitting can be used to handle this problem. The Mortality Data Base for 1951, 1961, 1971 and 1981 contain a total of 3,826 missing cases, and only with regard to marital status. Since the number of missing cases is relatively few (i.e., less than 1% of the entire data base)[12], it was felt that the deletion of such cases from the study should not cause severe bias in the results. When these cases were deleted from the data set, the total number of deaths dropped from 515,248 to 511,422 (see Table B-24 in the Appendix).[13]

It should also be mentioned that vital statistics involve *de jure* marital status (i.e., legal definitions of relationships, excluding commonlaw) while the census questionnaire deals with *de facto* status (which combines commonlaw and legally married together). This may result in death rates which are overestimated for the never-married (Peron and Strohmenger, 1985:224).

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[12] Of all data, mortality data are collected in the most continued and exhaustive manner (Peron and Strohmenger, 1985:237).

[13] These missing cases of death included deletion of unknown marital status as well as those classified as separated.

The design of the study may also cause bias. For instance, a periodic analysis is utilized in this study, and the causal assumption is of a current environment producing a current effect. The assumption of current effect may lead to error in interpreting time trends in health phenomena. Chronic diseases, for instance, may have a long latency interval between the operation of a cause and the manifestations of its effects. In periodic analysis, latent intervals of diseases are often ignored. Periodic analysis cannot take into account the variation in phenomena that arises from the differences in the environment to which each age group in the population was exposed as society changed during the time preceding the observation. Consecutive age groups constitute an array of successive generations and each is exposed to an unique historical environment that coincides with its life-span (Susser, 1973:83-84).

Thus, there are limitations with cross-sectional data, and incorrect inferences can be drawn from such data in numerous ways. Hopefully, by being aware of such potential causes of error, proper caution can be taken.

IV. DESCRIPTIVE ANALYSIS OF THE HYPOTHESES

Methods Used

In this chapter, the hypotheses outlined in Chapter 2 will be tested by utilizing standardized and unstandardized rates. The 'rate' is a technique conventionally used to express a demographic event in a given period of time divided by the population at risk during that period (Shryock et al., 1976:5). For instance, the number of deaths divided by the mid-year population is the crude death rate. The period is usually a year and the rate is often expressed per 100 or 1,000 of the population. The rate used in the analysis of this chapter will occasionally be the crude death rate, but more often, the rate will be refined into the age-specific death rate. This rate is more meaningful than the crude death rate since it is a more accurate measure of exposure to the risk of death for any given age group in the population. The general formula used is

$$ {}_{n}r_{x} = {}_{n}D_{x} / {}_{n}P_{x} \text{ X } 1{,}000 $$

where D is the number of deaths, x is the age group, n is the time period (in this case, 1 year), r is the rate, and P is the population alive. The population is restricted so as to correspond with the numerator. The rates will be specific for the characteristics under study in this thesis, namely: age, sex, marital status, region, and cause, and combinations of these variables.

The procedure utilized in eliminating the effect of differences in population composition with respect to sex, age, or other variables is called standardization. Such standardized rates have no direct meaning in themselves but are useful in comparison with groups of other similarly computed rates. Populations in each region in Canada, for instance, can be compared more equally in terms of death rates when their rates are standardized by age and sex. The direct method of standardization has been used in this chapter, and the standard population which has been chosen is the Canadian population for 1951[14] (divided into age groups of 35-44, 45-54, 55-64, 65-69, and 70+ to match the Vital Statistics and Census data--see Chapter 3). The formula calls for computing the weighted average of the age-specific death rates used, using as weights the age distribution of the standard population.[15] This is

$$\mathrm{SDR} = \sum_{j}^{n} r_i P_i \Big/ \sum_{j}^{n} P_i\,, \qquad i=35\text{-}44,\ n=70+$$

where SDR is the standardized death rate, j equals age group beginning at ages 35-44, and n equals age group ending at ages 70+, r is the rate (of i age group) and P is the standard population (at each age group i), and ΣP_i the total standard population. Each age-specific rate is multiplied, in effect, by the proportion of the standard population in each age group (Shryock et al., 1976:241-2). The standardized rate thus gives the number of deaths per 1,000 that would have been recorded in Canada if the age composition of the population had been the same as in 1951.

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[14] In comparing regions, the national population is very often used as the standard, as was the case in a recent study on the geography of mortality in Canada, the *Mortality Atlas of Canada* (Peron and Strohmenger, 1985:111).

[15] These numbers are, respectively: 1,867,700, 1,407,335, 1,076,842, 433,497, and 652,776. The total is then divided by the summation of these numbers: 5,438,150.

The hypotheses discussed in Chapter 2 will now be tested with the data by using appropriate rates. Also, in addition to the overall Canadian analysis, regional effects on the death rates, where appropriate, will be examined.

Results

H1. The first hypothesis predicted that Canada's aging population continues to grow while its death rate declines. Table 4-1 shows that this is overwhelmingly the case. The population 35 and above shows an increase of 83.6% from 1951 to 1981, and median age has increased by 3.2% since 1951, illustrating that Canada's population is indeed aging over time. Conversely, the age-specific death rates (ASDR) show decreases of 24.1% to 39.2% during the same time period. The standardized death rate also shows a decline of 27.1% over time, illustrating that even when standardizing Canada's population over time for age, a substantial decline occurs between 1951 and 1981. Minor discrepancies shown in columns B and C for the standardized death rates (15.6 increased to 15.7) and the ASDR for 35-44 (2.2 to 2.3) are of

TABLE 4-1

Population 35+ and Death Rates (Standardized and Unstandardized) Compared; Canada: 1951, 1961, 1971, and 1981

	A 1951	B 1961	C 1971	D 1981	E[1] % Change 1951-1981
Population 35+	5,430,833	6,938,672	8,280,900	9,969,050	+83.6%
Standardized Death Rate	18.3	15.6	15.7	13.3	-27.1%
Median Age 35+	53.1	53.1	54.0	54.8	+3.2%
AGES					
34-44					
Population	1,864,475	2,385,138	2,520,630	2,960,105	+58.8%
ASDR[2]	2.8	2.2	2.3	1.7	-39.2%
45-54					
Population	1,405,314	1,875,579	2,287,695	2,493,690	+77.5%
ASDR	6.8	5.8	5.5	4.7	-31.3%
55-64					
Population	1,075,668	1,287,870	1,729,495	2,156,240	+100.5%
ASDR	16.5	14.6	13.5	11.4	-30.9%
65-69					
Population	433,139	486,662	619,385	843,520	+94.7%
ASDR	30.0	28.2	25.5	22.1	-26.1%
70+					
Population	652,237	903,423	1,123,695	1,515,495	+132.4%
ASDR	82.6	76.5	72.8	62.7	-24.1%

[1] Percentage change (Col.E) calculated: Col.D-Col.A/Col.A X 100=%

[2] Age-Specific Death Rate

SOURCES: Population--Table B-28; Rates--Table B-37; Median Age--Table B-20.

insignificant magnitude and therefore do not affect the overall results.

Thus, Hypothesis 1 is supported by the data.

Hy2. It had been hypothesized that in the context of epidemiological transition, death rates due to cardiovascular disease and malignant neoplasms have been increasing from 1951 to 1981. Table 4-2, however, shows varied results. Death rates (both unstandardized and standardized) have been increasing for malignant neoplasms over time in Canada and the regions, but decreasing (overall) for cardiovascular mortality.

The increase in mortality due to malignant neoplasms is recognized in a recent article entitled "Cancer Patterns in Canada," by Wigle and associates. They write that "cancer is diagnosed in about 70,000 Canadians each year," and that "life-threatening forms of cancer will develop in at least one of every three Canadian newborns during their lifetimes if current cancer risks are not reduced" (Wigle et al., 1986:231). The results in Table 4-2 illustrate how the standardized rates of cancer have increased in Canada and each region over time, from 17.4% (the Atlantic) to 1.7% (Quebec).

Cardiovascular disease, although continuing to be a leading cause of death in Canada and in the United States, has been on the decline over the past 30 years: 19.5% in Canada (see Table 4-2) and 35% in the United States (Levy,

TABLE 4-2

Unstandardized and Standardized Death Rates of Cardiovascular Disease and Malignant Neoplasms by Year and Region

	A 1951	(Std)	B 1961	(Std)	C 1971	(Std)	D 1981	(Std)	E''' % Change 1951-1981 %	(Std) %
CARDIOVASCULAR DISEASE										
Canada	7.2	(7.2)	7.2	(7.0)	6.6	(6.1)	5.8	(4.9)	-19.5	(-31.9)
Atlantic	6.7	(6.1)	7.3	(6.6)	7.5	(6.4)	6.8	(5.4)	1.5	(-12.0)
Quebec	6.6	(7.4)	6.7	(7.5)	6.2	(6.4)	5.3	(4.8)	-20.0	(-34.8)
Ontario	8.1	(7.8)	7.8	(7.6)	6.9	(5.5)	6.0	(5.1)	-25.2	(-35.2)
Prairies	6.3	(6.4)	6.2	(5.7)	6.1	(5.3)	5.8	(4.7)	-8.1	(-26.8)
British Columbia	7.7	(6.9)	7.8	(6.5)	6.5	(5.5)	5.4	(4.4)	-29.8	(-36.5)
MALIGNANT NEOPLASMS										
Canada	3.1	(3.1)	3.2	(3.2)	3.6	(3.4)	3.9	(3.4)	26.1	(11.0)
Altantic	3.1	(2.9)	3.3	(3.1)	3.8	(3.3)	4.1	(3.5)	32.1	(17.4)
Quebec	3.2	(3.6)	3.4	(3.7)	3.8	(3.9)	3.9	(3.6)	20.5	(1.7)
Ontario	3.1	(3.1)	3.2	(3.2)	3.4	(3.3)	4.0	(3.5)	26.6	(13.4)
Prairies	2.9	(2.9)	3.0	(2.9)	3.4	(3.1)	3.8	(3.2)	32.5	(11.9)
British Columbia	3.1	(2.9)	3.4	(3.0)	3.6	(3.2)	3.8	(3.2)	22.1	(13.0)

'''Percent change calculated: Col.D-Col.A/Col.A X 100 = %

SOURCE: standardized rates--Tables B-38, B-39; unstandardized rates--Tables B-29, B-30.

1981:49). Most of the decline has occured between 1971 and 1981. Levy suggests that this decline occured primarily due to the relative contributions of primary prevention of disease and improved medical treatment. He states further that this decline is not universal, and in many other countries such as those of Eastern Europe, Ireland, Scotland, West Germany, and Denmark, cardiovascular death rates are actually increasing (p.67). Declining mortality appears to be correlated with life style changes and risk factor modification in countries where such changes are being actively encouraged (pp.66-67).'' Much of the change in hypertensive disease mortality is believed to be hidden in the various components of diseases of the cardiovascular system, especially cerebrovascular diseases and ischaemic (coronary) heart disease. The close links between hypertension and ischaemic heart disease, however, imply that they cannot properly be considered apart (Moriyama, 1983:287; Rose, 1984:375).

There appears to be general agreement that improvement in ischaemic heart disease mortality can be likely attributed to decreased 'provoking factors' and/or to

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''There may be some question of lag time between the observed behavioural changes and the subsequent incidence changes. Experience from controlled trials in Norway suggest that the lag time for coronary heart disease is two to five years, although recent information from the United States suggests no lag in the relationship of smoking to heart disease mortality (Thelle, 1985:57; Kristein, 1984:317). Similarly, information from the United States suggests that the lag time between exposure and clinical diagnosis for current cancer deaths may be up to 20 years (*Chronic Diseases in Canada*, 1984:65).

increased 'protective factors'. Decreases in 'provoking factors' include cigarette smoking and consumption of saturated fat and chloresterol (Moriyama, 1983:289-290; Hertzel, 1983:257; Patrick et al., 1982:166; Thelle, 1985:52), while increased 'protective' factors may include improved therapy and control of hypertension, increased physical exercise during leisure time, and more coronary care units available (Stern, 1979).'' Heart disease mortality reductions may in turn have influenced declines in stroke mortality. It is difficult to assess the role of each factor singly.''•

Since death rates for both malignant neoplasms and cardiovascular disease have not been increasing, Hypothesis 2 cannot be supported. The Epidemiological Transition Theory, while explaining an increase of overall chronic disease mortality over time, does not seem to account for the apparent decrease in cardiovascular disease mortality. It is possible that the Epidemiological Transition has been completed (probably between 1951 and 1961 since some of the regions still show a slight increase in cardiovascular

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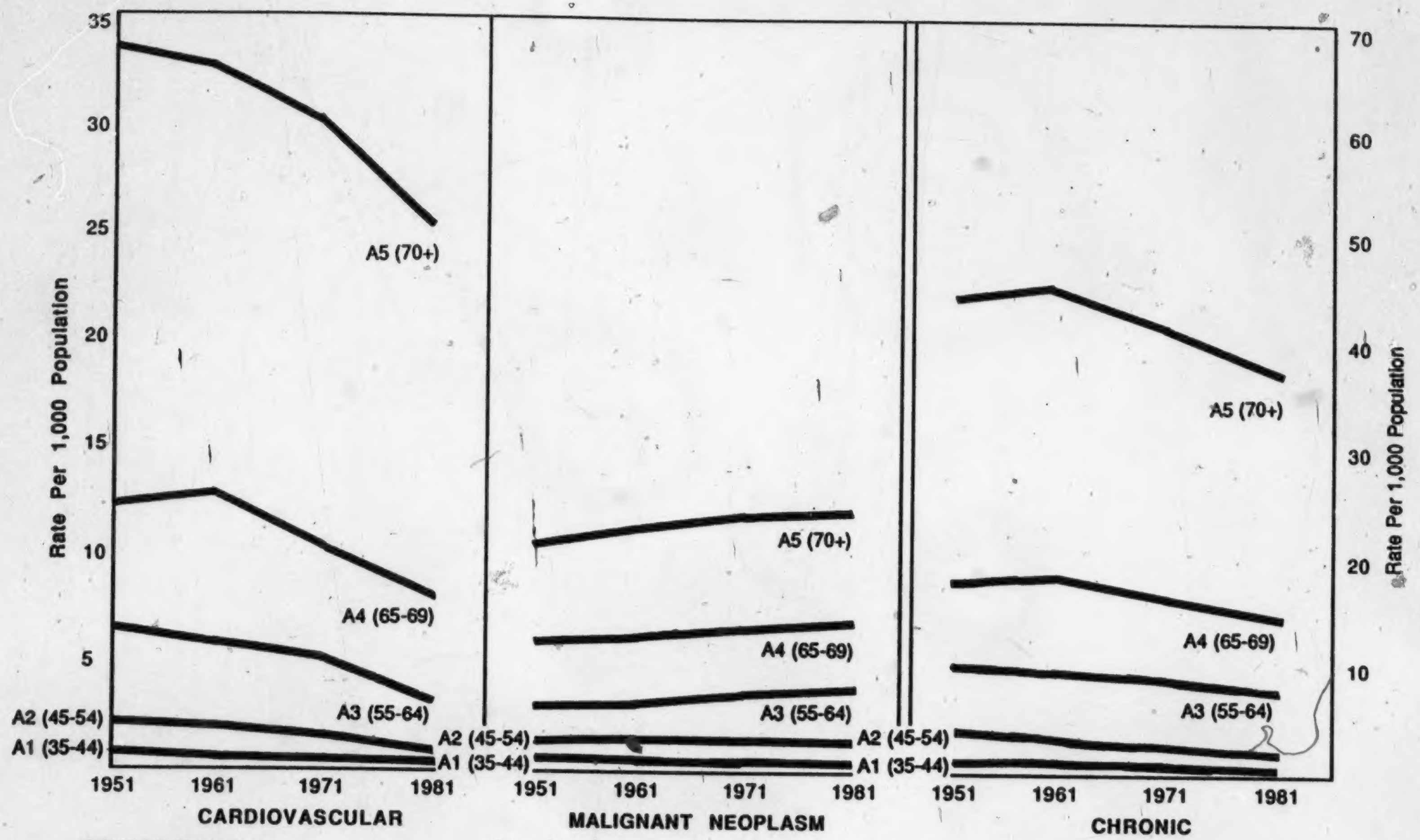
''Stern, however, believes that emergency medical services and coronary bypass surgery were not used widely enough in early years to have contributed to the improvement in ischaemic (coronary) heart disease mortality (Moriyama, 1983:289-290).

''•In addition to life style and medical aspects, class and education differentials are beginning to become apparent in coronary heart disease. For instance, in developed countries like England, Wales and Canada, coronary heart disease is most common in low socio-economic classes, and data from Australia suggest that the greatest declines are occuring among the better educated people (Pyorala et al., 1985:9; Millar, 1985:334).

mortality at this time before the major decline occurs) and can no longer be applied to explain current chronic death rates. A more complete test of this theory would require data further back in time in order to better determine the transition (i.e., such as in Omran's analysis). Olshansky and Ault (1986) suggest that there may in fact be a fourth stage in the epidemiologic transition; a stage characterized by rapidly declining mortality in advanced ages caused by a postponing of degenerative diseases at earlier ages. This unanticipated decline in death rates began, they speculate, in the mid-60's (pp.386,359).

Since cardiovascular disease has been a major cause of mortality over the past several decades, it has received additional screening and has responded to increased preventative measures. It will be interesting to see whether cancer death rates will follow a similar direction in the future. The etiology of cancer, however, may be radically different than the etiology of cardiovascular disease. That is to say, public awareness has seemingly decreased cardiovascular disease mortality, but this awareness may not be enough to affect cancer mortality in the same way.

Hy3. Olshansky and Ault (1986) believe that mortality 'compression' accounts for a decline in chronic death rates at the earlier ages and an increase at the older ages. Figure 4-1 and Table 4-3 illustrate the trend in Canada from 1951 to 1981 of the age-specific death rates (ASDR) of



(SOURCE: Table B-1)

FIGURE 4-1

Age-Specific Death Rates Graphed for the Various Age Groups: Cardiovascular Disease Mortality, Malignant Neoplasm Mortality, and Chronic Disease Mortality, Canada. 1951-1981.

TABLE 4-3

Mortality Compression in Chronic Diseases for Canada

Age	Mortality Expected	Col.1 CARDIOVASCULAR Mortality Observed	Col.2 MALIGNANT NEOPLASMS Mortality Observed	Col.2+3 CHRONIC DISEASE Mortality Observed
(A1) 35-44	-	-	-	-
(A2) 45-54	O	-	O	-
(A3) 55-64	+	-	+	-
(A4) 65-69	+	-	+	-
(A5) 70+	+	-	+	-

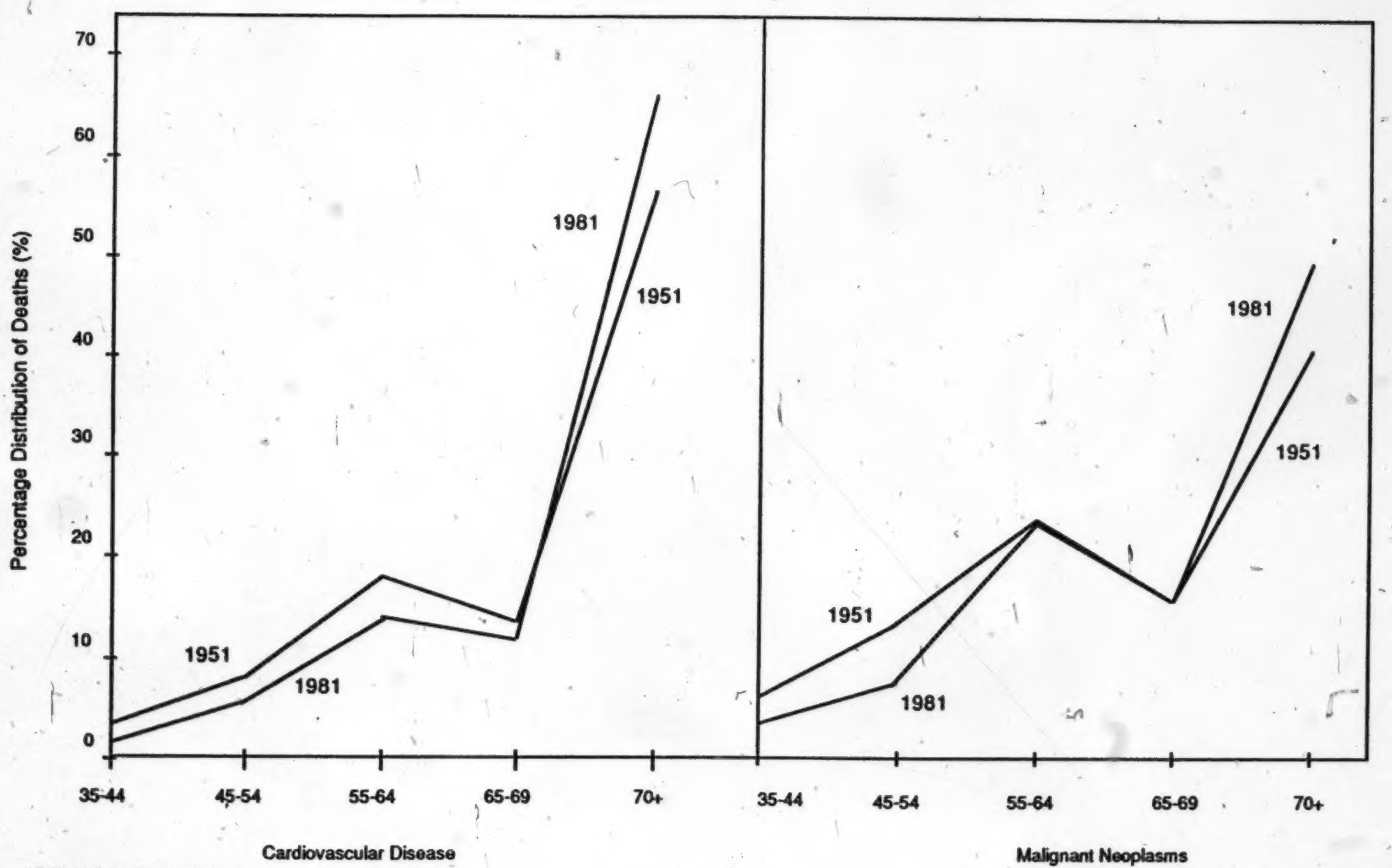
'+' means increase of mortality over time (1951-1981)
'-' means decrease of mortality over time (1951-1981)
'O' means remaining the same, or relatively stable over time (1951-1981)

SOURCE: Olshansky and Ault (1986); Figure 4-1.

cardiovascular disease mortality, malignant neoplasms, and chronic mortality (cardiovascular disease and malignant neoplasm mortality together).

Mortality, whether it is caused by cardiovascular disease, malignant neoplasms or the two together (chronic mortality), seems to be postponed to the older ages since the ASDR is progressively greater as age increases. The pattern displayed by the ASDR over time for malignant neoplasms coincides with the diagram anticipated in Hypothesis 3, Chapter 2, which illustrates Olshansky and Ault's theory of mortality 'compression'; however, the diagrams displayed by the ASDR of cardiovascular disease mortality and chronic disease mortality (which includes cardiovascular disease mortality) do not clearly display this trend (see Table 4-3). Cardiovascular disease death rates appear to reflect the benefits of positive life style changes by showing a decline over time at all ages. This is similarly the case for chronic disease.

When the percentage distribution of deaths from cardiovascular disease or malignant neoplasms in relation to all deaths is graphed for each time period, by age group (as illustrated in the Olshansky and Ault article), a lowering of percentages in deaths is evident in the youngest ages while the percentage of deaths at the oldest ages have increased over time, for both chronic diseases (see Figure 4-2). This percentage, however, does not take into consideration the population at risk. Also, the trend may be



(SOURCE: Table B-2)

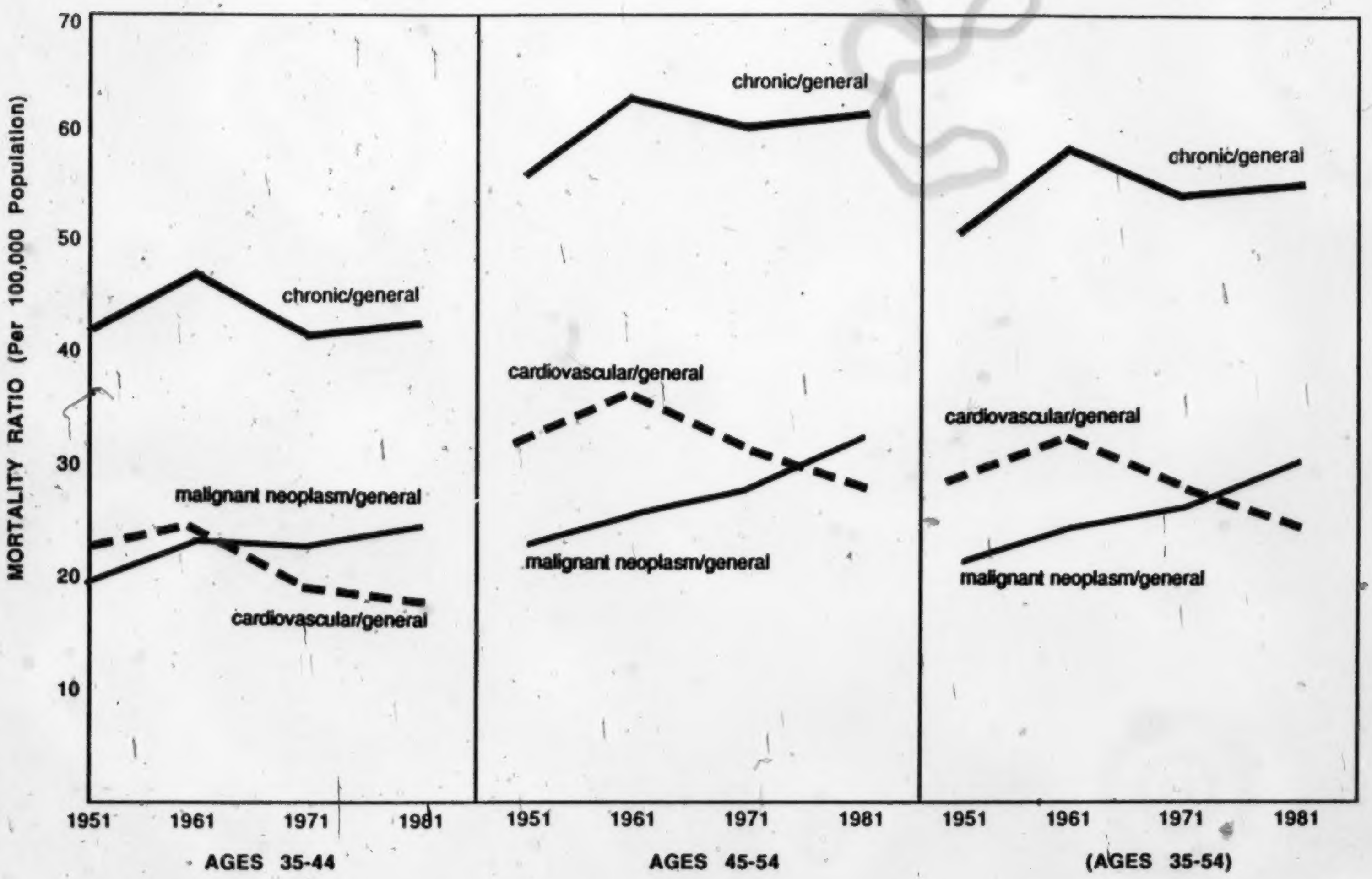
FIGURE 4-2

Percentage Distribution of Deaths from Cardiovascular Disease and Malignant Neoplasms, for Canada by Ages 35+. for 1951 and 1981.

more a result of the changing age-sex composition of the population rather than a result of life style changes. Thus, due to the overall declining *rate* of cardiovascular disease for all ages, Hypothesis 3 cannot be supported for chronic disease mortality in general. It is supported for malignant neoplasm mortality, but not for cardiovascular disease mortality.

Hy4 proposes that life style has an effect on mortality. The extent to which life style may have an effect on mortality may be inferred through the use of a ratio (a relative measure) between chronic and general death rates for the younger age groups (i.e., older age groups may be greatly affected by biological degeneration and thus are excluded). The cardiovascular mortality ratios, malignant neoplasm mortality ratios, and chronic mortality ratios for ages 35-44, 45-54, and 35-54 are displayed in Figure 4-3 for Canada. Figure 4-4 shows the trends for Canada and the regions compared.

As the reader will see, the results again are varied. For the cardiovascular disease mortality ratio, the trend in Canada shows an initial increase between 1951 and 1961 and then a decline in the ratio for all the ages displayed. This is overwhelmingly the case in all the regions (see Table B-3 in Appendix B) except for a few minor variations: the Prairies, where no initial increase occurs for ages 35-44; and in the Atlantic region, where the increase in ages 35-44



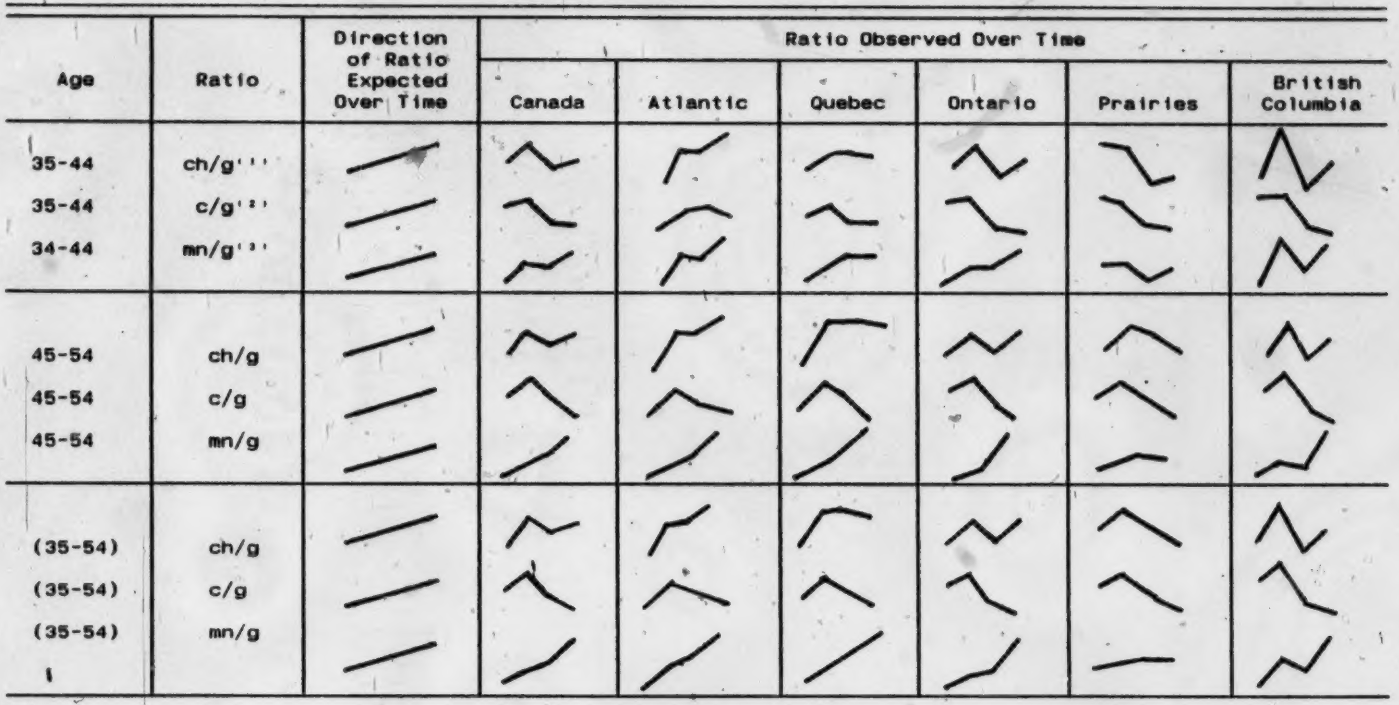
(SOURCE: Table B-3)

FIGURE 4-3

Illustration of Mortality Ratios for Various Ages, Canada; 1951-1981

FIGURE 4-4

Mortality Ratios for Various Ages, Canada and Provinces, 1951-1981



⁽¹⁾ch/g = chronic disease death rate for year, age group/general death rate for year, age group
⁽²⁾c/g = cardiovascular disease death rate for year, age group/general death rate for year, age group
⁽³⁾mn/g = malignant neoplasm death rate for year, age group/general death rate for year, age group

SOURCE: Table B-3.

continues to 1971 before a decline occurs. This information about cardiovascular disease mortality alone demonstrates that Hypothesis 4 must be rejected, in that presumably, negative life style influences, as operationalized in this thesis, do not appear to significantly affect cardiovascular mortality over time at the youngest age groups (35-44, 45-54 and 35-54).

The malignant neoplasm mortality ratio shows very different results. The pattern generally displayed is one of increasing risk over time, thus supporting Hypothesis 4. The exceptions are the Prairies and the British Columbia regions. The Prairies show a decline in the ratio of malignant neoplasm mortality to general mortality from 1961 to 1971 at ages 35-44, and a decline from 1971 to 1981 at ages 45-54. The ratio appears to remain almost constant from 1961 to 1981 when the ages 35-54 are viewed together. This may be the result of the overall decrease in the ratio at ages 35-44 and overall increase in the ratio at ages 45-54 counter-balancing each other when viewed together as a group. As for British Columbia, the decline, like in the Prairies region, is most marked at ages 35-44 between 1961 and 1971. The implication of this decline is that a similar trend in malignant neoplasm mortality appeared for young people aged 35-44 between 1961 and 1971 in western Canada (British Columbia and the Prairies) which did not occur to the same degree in the rest of Canada. Yet a similar but more minor 'ripple effect' occurs during these years for ages 35-44 for the other regions (except Quebec, however), and Canada overall. A slight decline in the ratio also occurs in British Columbia for those aged 45-54 from 1961 to 1971, implying that some event may have happened in British Columbia between 1961 and 1971 (medical, or possibly demographic) which greatly decreased the malignant neoplasm mortality of those aged 45-54 in that decade.

The chronic mortality ratio is really a statistical compromise between the two differing patterns of the cardiovascular mortality ratio and the malignant neoplasm mortality ratio. The Canadian pattern of increase-decrease-increase in the chronic mortality ratio between 1951 and 1981 is echoed closely by Ontario and British Columbia, and to a lesser extent, in the Atlantic region. Quebec and the Prairies, in this case, are the exceptions. Quebec, in all three age categories, shows an initial increase and then a slow decline to 1981. The Prairies show a similar pattern. The 35-44 age category, however, shows a decline only from 1951 to 1971, which makes it the most different from all the other regions and age categories.

The declining malignant neoplasm mortality in British Columbia between 1961 and 1971 seems to have somehow influenced the neighbouring region of the Prairies, although the decline seems to have had a longer lasting effect in the Prairies than in British Columbia (judging by the chronic disease ratio and malignant neoplasm mortality ratio after

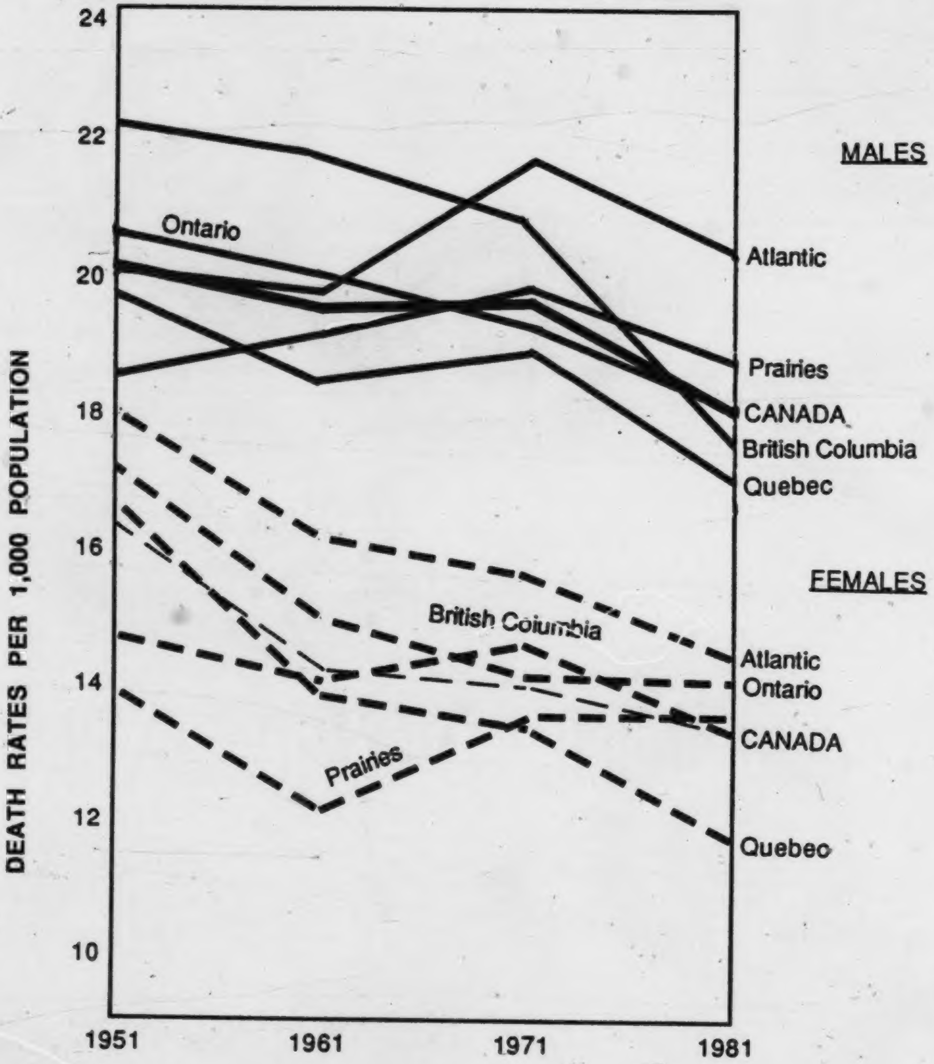
1971 for ages 35-54). Perhaps a large number of healthy young people migrated to British Columbia and the Prairies from the rest of Canada (from 1961 to 1971) in search of jobs, thus lowering the malignant neoplasm mortality ratio in those regions while raising it in other regions (where less health ones remained). After 1971, an economic depression in British Columbia (due to so much in-migration) may have forced many of the young people to leave British Columbia to return to their former homes, thus raising the malignant neoplasm and chronic disease death rates in British Columbia (in comparison to general mortality), as it is usually the healthier people who migrate. The laws of migration state that more people migrate shorter distances than longer ones, and the Prairies region, being the closest region to British Columbia and also experiencing an oil boom in the '70's, would have attracted many of those leaving British Columbia, who would bring with them their likely reduced chances of cancer. The result would have been a continuation of the Prairies' already low malignant neoplasm mortality ratio. The oil slump did not occur until after 1981 in Alberta, so it would not be until after 1981 that further migration would occur, mostly to points east of the Prairies. If this theory is correct, then the data should show an increase in the chronic death ratio and malignant neoplasm ratio in British Columbia and the Prairies after 1981 and a decrease in the same in Ontario and Quebec. Cancer (malignant neoplasms) affects young people in increasing numbers, unlike cardiovascular disease which occurs over time and later in life. Since mostly young people would have likely migrated (for economic opportunities), the malignant neoplasm ratio would have been more affected between 1961 and 1981 (and was) by migration than would the cardiovascular disease ratio.

From the varied results, it is obvious that except for malignant neoplam mortality (and even then, not in all cases), Hypothesis 4 cannot be supported. The results show a decline rather than increase in the ratio of chronic disease death rates and cardiovascular disease death rates to the general death rates. This contradicts the assumptions of Hypothesis 4, which proposes that life style habits of the young have an increasingly deleterious affect on their health. Malignant neoplasm mortality has increased, compared to general mortality; cardiovascular disease mortality and chronic disease mortality, on the whole, have decreased. The implication is that *negative* life style habits like smoking, excessive drinking, et cetera, seem to increase cancer rates; but conversely, recent *positive* life style changes like increased exercising, screening for cardiovascular diseases, and decreasing chloresterol intake, seem to be decreasing mortality from cardiovascular disease. Perhaps the two types of chronic disease respond to *different* aspects of life style. For example, the negative aspects of life style may more greatly affect cancer, while the positive aspects affect cardiovascular disease.

It is suggested that chronic diseases not be studied as an aggregate since there appear to be two opposing trends in mortality over time: one increasing (malignant neoplasms) and the other decreasing (cardiovascular disease).

Hy5. The demographic assumption that males, in a modernized country, die at a higher rate than females, at all ages, is supported in the Canadian case, as illustrated by Figures 4-5 and 4-6. In every case and in each region, males the same age as females have a higher general death rate. The theory that men's life styles are more deleterious to their health seems to be supported by the data. This also emphasizes the fact that more men than women are dying, leaving an unbalanced sex ratio in the favour of women, especially at the oldest ages. (This topic will be expanded in the last chapter with regard to implications for policy.)

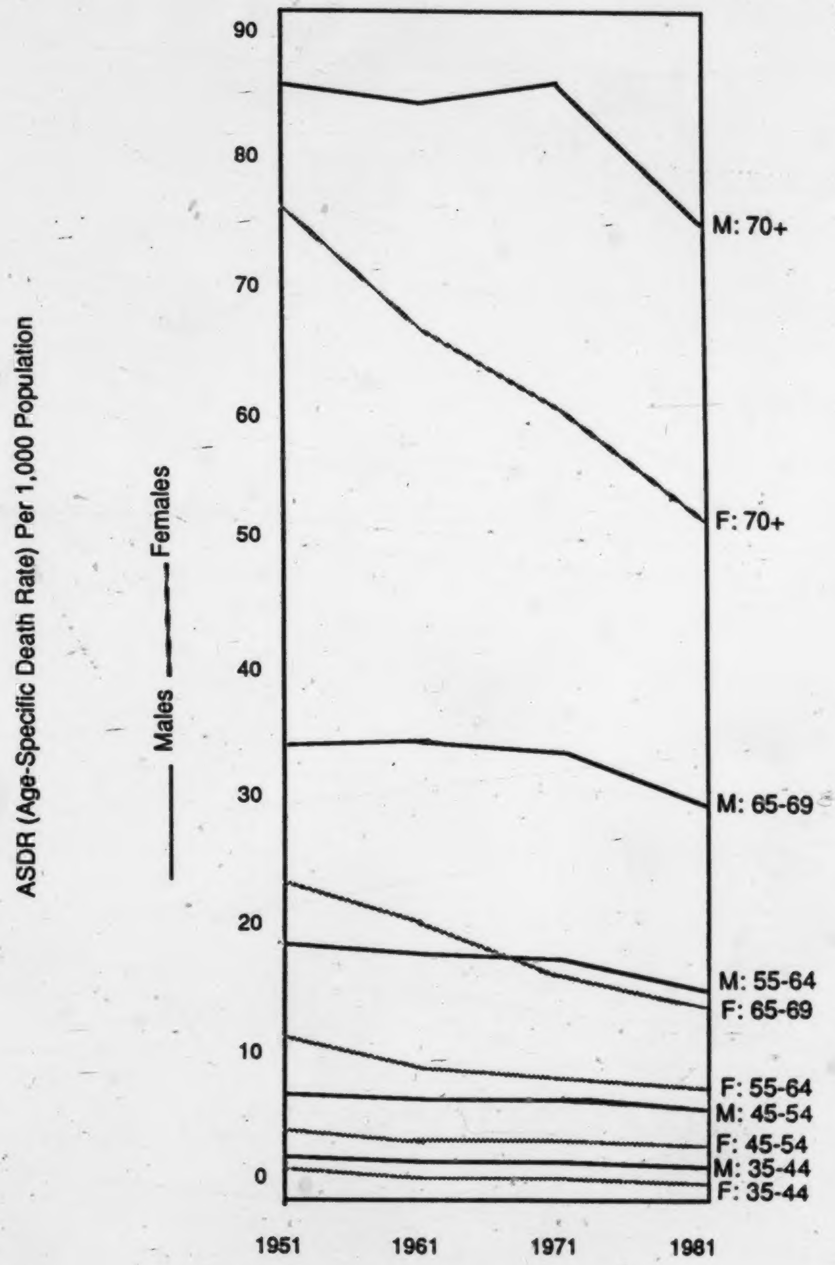
Hy6. The general death rate is decreasing over time for both sexes as shown in the previous Figures 4-5, and 4-6. There are exceptions, however. For instance, in Figure 4-5, (the mortality of those aged 35+) an overall gradual decline is demonstrated, more obvious in the case of females than males, except for the Prairies region (see Table B-4) which shows an increase in female mortality from 1961 to 1981. British Columbia also shows a similar increase of the death rate for females from 1961 to 1971 but the rate significantly declines after than point. Looking at Table



(SOURCE: Table B-4)

FIGURE 4-5

Canada and Regions: Death Rates for Ages 35+, Both Sexes, 1951-1981.



(SOURCE: Table B-4)

FIGURE 4-6

ASDR, Both Sexes. Various Ages: Canada. 1951-81.

B-4, the only increase in the mortality rate of females in the Prairies is at age 70+ between 1961 and 1971, and in British Columbia at ages 70+ and 45-54 during the same years. This may be due to a less healthy migratory population of women moving to the West and the Coast from the rest of Canada, probably with their husbands, who are at the peak of their careers and/or are retiring. The western part of Canada (especially the Coast) has long been thought of as a desirable place to retire because of scenery, or for health reasons, a milder climate. The Prairies would be starting to gain attractiveness due to the upcoming oil boom and thus would attract executives from other parts of Canada and the United States. Unfortunately, these data do not show a breakdown by socioeconomic status, so much must be inferred.

The age- and sex-standardized data (Table B-4) illustrates that in the Prairies and in British Columbia there was no increase in the death rate over this time period. This would lead one to assume that the temporary unstandarized death rate increase was indeed due to a higher death rate of women at selected older ages, and that these women were possibly unhealthy newcomers to these regions. Later in this chapter, these regions will be examined by sex, age, and marital status with regard to chronic disease. It will be shown whether the Western-most regions were affected excessively by chronic disease or whether this mortality was due to other causes.

As for male's mortality in Canada, the overall decline is marked, especially after 1971. An increase in the unstandardized general death rate for men, however, occurs between 1951 and 1961 in the Prairies, and between 1961 and 1971 in the Atlantic and Quebec regions. None of the age groups in the Prairies, however, show an increase between 1951 and 1961, so it must be assumed that this increase shown in Figure 4-5 for the Prairies is an effect of the overall age composition on the death rates. Similarly, no age groups for males in the Quebec regions demonstrate a marked increase in the general death rate between 1961 and 1971. Between 1961 and 1971, however, a steep increase in the death rate occurs in the 70+ category in the Prairies as well as in the British Columbia region and the Atlantic.

When standardized for age (Table B-4), the only regions showing a slight rate increase for males between 1961 and 1971 are the Atlantic, Prairies, and British Columbia regions. Goldscheider (1971:124) would suggest that decreasing death rates are due to improved health and living standards, so the opposite should be true if the rates were increasing. But would the three regions of the Atlantic, the Prairies and British Columbia have decreasing health standards? And over one decade only? Assuming that the data are correct, the implication is that for a decade, reduced health expenditure by the Government in those regions caused excessive mortality in men (mainly at 70+, although there appears some increased mortality in British Columbia at ages

55-64, and ages 55-64 and 65-69 in the Atlantic region). Later in this chapter, these regions will be checked again with regard to chronic disease mortality. If there was an excessive increase in these regions due to chronic disease of men at the older ages, then it may be implied that these regions were perhaps less equipped to handle the morbidity, and ultimately mortality, of chronic disease by men at these age groups.

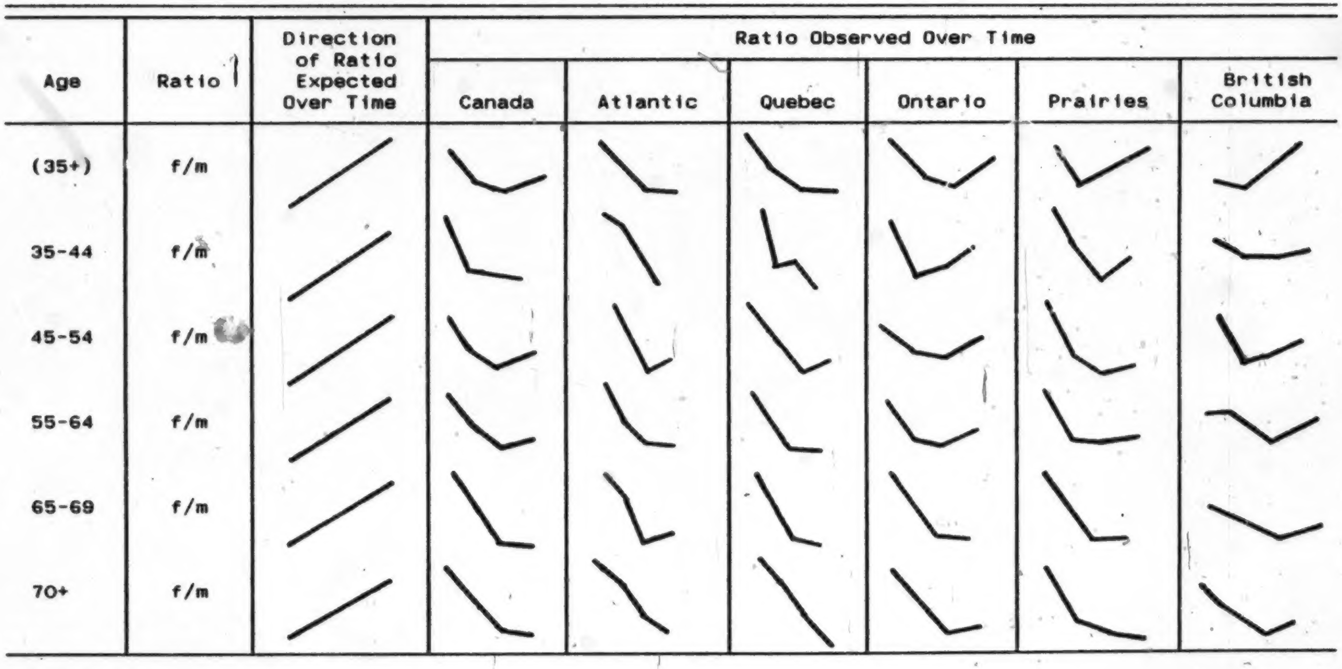
Hypothesis 6 is supported overall by the data, with minor general mortality increase in certain regions. Later analysis in the chapter will hopefully help to pinpoint the increase of mortality by cause, and the multivariate analysis in Chapter 5 will determine if the increases are statistically significant.

Hy7. Differences in mortality between the sexes are hypothesized to be caused by life style factors (Retherford, 1975; Waldron, 1976). It is also hypothesized that over time, the death rates between the sexes will be narrowing, due to modernization and life style changes. Looking at the Figures 4-5, 4-6 and Table B-4 used for analysis of Hypotheses 5 and 6, it appears that the rates between men and women, at various ages in the regions, were in some cases widening over time, and in other cases, narrowing.

Examination of Figure 4-7 (a summary of Table B-4 in Appendix B), shows the relationship of female to male general mortality more clearly by the use of ratios. At a

FIGURE 4-7

Female to Male General Mortality Ratio (f/m)(1), for Various Ages, Canada and Provinces, 1951-1981



(1) f/m = Female general death rate, for age group and year/male general death rate for age group and year X 100.

SOURCE: Table B-5.

glance, it seems that the trend at most of the ages and in most of the regions has been to decline until 1961 or 1971 and then increase. The *decline* implies that life style has not affected women as deleteriously as men; however, with the *increase* in almost every case since 1971, the implication is that life style indeed has started to negatively affect women, indicated by a narrowing of the gap between men's and women's death rates. This mortality change may well be caused by a change in the nature of men's and women's social roles. Increased stresses which could lead to increased mortality for women could be generated through heightened career and job aspirations as more and more women enter or re-enter the labour force and take on responsibilities of motherhood AND career.[11] Also, increasing single-parent families with women as head may contribute to their increased stresses which may trigger higher death rates. Conrad (1962) and Waldron (1976) describe the phenomenon of the 'masculine sex role' which leads to greater risk-taking and a greater experience of occupational stress. With more women adopting increased responsibilities outside of the traditional 'feminine' realm and adapting the 'masculine sex role', then like for men, the accompanying stresses of such a role are taking their toll. Aggregate changes in social role do not usually occur overnight; this is evident by the trend in the Figures, which in almost every case, show a stylized 'u' shape as the change occurs over time, and the trend of mortality starts to reverse.

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[11] There is also concern that housewives (married women not in the labour force) are becoming dissatisfied with their status and are also suffering poor health consequences (Verbrugge, 1983:221).

The 'masculine sex role' for women is a very recent phenomenon, and seems to be occuring in most industrialized countries. It makes sense that this trend of gradually narrowing mortality between the sexes, as illustrated by the ratio, was not apparent at the earliest years, since it appears to be the product of the '60's and '70's.

The more traditional regions, Quebec and the Atlantic, are lagging behind the other regions of Canada in illustrating this trend, and their overall ratios for ages 35+ (Figure 4-7 and Table B-5) show a continued, although slowed, decline of rates (i.e., a continued, widening general mortality between the sexes), implying that women in these regions have not taken on the more 'masculine-type' roles and their associated stresses to the same degree that their 'sisters' have in the rest of Canada. This is especially apparent at the earliest ages of 35-44 and at the oldest ages, 70+. Quebec is consistent in this downward trend at all the ages except for the ages 45-54, where since 1971, a definite increase can be discerned. What may affect Quebec's slow adoption of this life style trend (as illustrated by the mortality ratio) is a 'culture lag' (Ogburn and Nimkoff, 1958:717) perhaps due to its strong Catholic (and thus conservative) ties, but also its strong separatist views, which may discourage imitation of life style trends of the rest of Canada.

Only marginally less conservative than Quebec, the Atlantic region shows an increase in the ratio only at ages 45-54, and 65-69. Geographical isolation may be responsible for the slow social change in the Atlantic region. Also, high unemployment may also limit women from finding employment outside of home and to thus become involved in the more male-related career stresses. Finally, this phenomenon of women adopting non-traditional roles may be primarily practised in large urban areas where opportunities exist, and these roles in some cases may be linked with life style fashion trends. The Atlantic is still largely a fishing and farming region and lacks the sophistication of larger metropolises. In contrast, Ontario and British Columbia (and to a lesser extent, the Prairies), are more urban and fashion- and trend-conscious and it is not surprising that they are the strongest and earliest supporters of career-oriented women who are likely to adopt more 'masculine-type roles' (as implied by the mortality ratio).

Hypothesis 7 is thus supported by the data. Although the initial trend illustrated a decline (and thus a widening of the death rates between the sexes) it seems apparent that the changing role of woman within society like any major social change, will take time, and may eventually affect mortality. A reversal in the ratio of mortality between females and males, however (i.e., a decrease in the death rate between the sexes), seems to have become established by 1981.

A question is raised regarding the nature of the mortality ratio: is the male mortality rate declining, the female death rate increasing, or both? What trend is causing the ratio to begin to show a narrowing of the mortality gap between the sexes? Returning to Figure 4-6 and Table B-4, it appears prudent to study those regions which illustrate the greatest trend reversal--namely, British Columbia, Ontario, and the Prairies. In the British Columbia region, it appears as though the mortality of males and females is declining at about the same rate, at least at the oldest ages. At the youngest ages, mortality may be declining somewhat more steadily for males than it is for females. In the case of Ontario, the decline of the male death rate is more marked than that of the females'. Similarly in the Prairies region, the females' death rate appears to slow considerably after 1961 as though checked by some factor, while the males' rate continues to steadily decline. This 'checking' of the female death rate does not seem as apparent in the Atlantic and Quebec regions, and a widening of the sex rates is still apparent, although at many of the ages, after 1971, some decline is slowed in the case of the rates of females.

It appears then, that the changing ratio of female-male death rates is largely the case of continued and increased decline in the general male death rates while the decline in the female death rates has slowed. Modernization and life style changes are, and have been, generally more advantageous to women than to men with regard to mortality decline, although recent evidence of a reverse of this trend is apparent in the ratio.

Hy8. Further to the discussion of the phenomenon of the 'masculine sex role' (Waldron, 1976; Gove and Hughes, 1979), death rates for males and females with regard to chronic disease are now analyzed. It was earlier hypothesized that death rates from cardiovascular disease and from cancer would be higher for men at all ages. The results are shown in Figures 4-8 and 4-9.

For ages 35+ (Figure 4-8), male death rates from both cardiovascular disease and malignant neoplasms appear to be higher for males than females, in all the regions, across time.[19] A quick scan of the Figures, however, shows several discrepancies in the age categories in the regions. In every region, for ages 35-44 and 45-54 (the youngest ages in this study), female mortality from malignant neoplasms is higher than the males' during at least one or two time periods, and in most cases, it remains higher over the entire three

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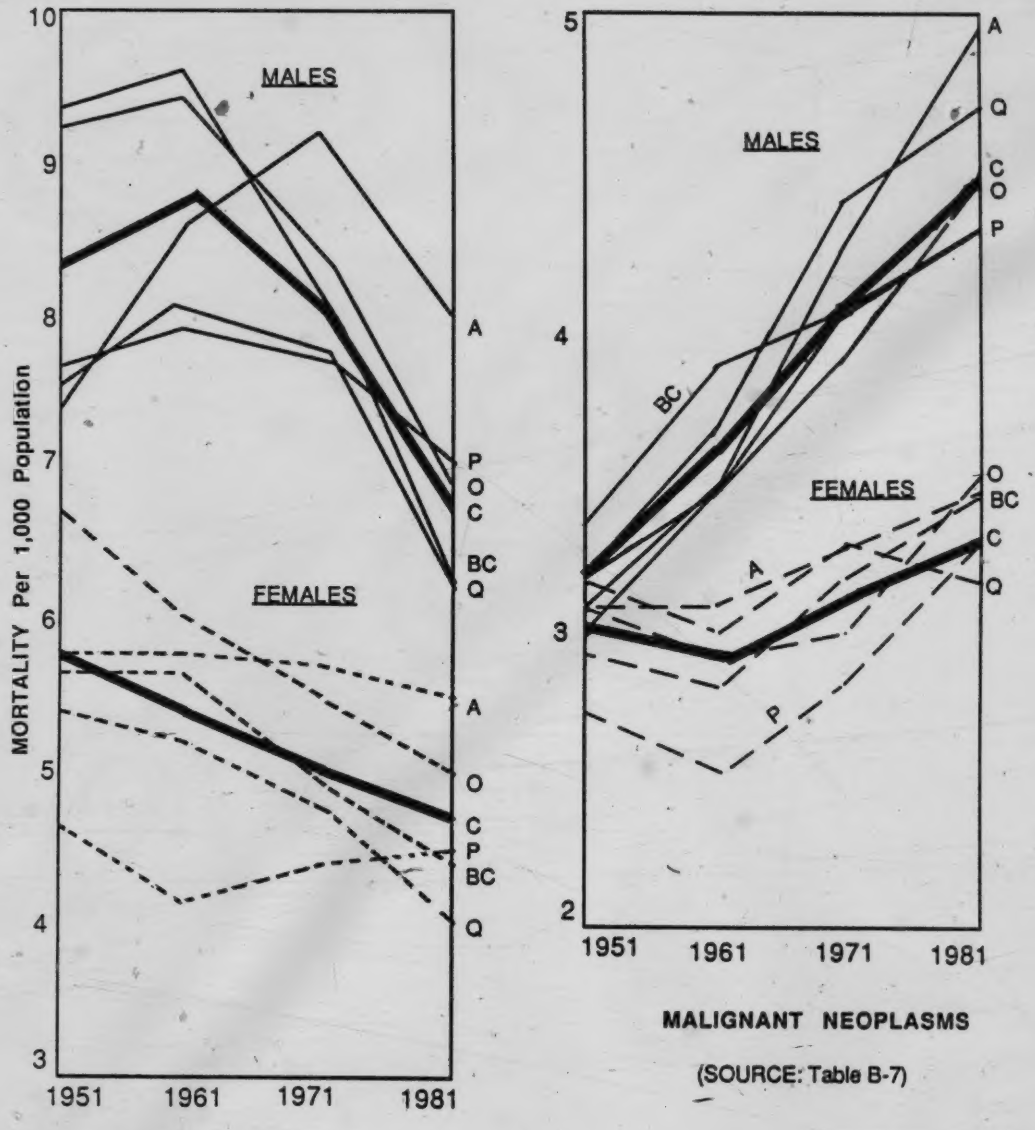
[19] High rates of cancer for males in Quebec is supported by research by Wigle and associates (1986). They propose that high rates of death from lung cancer in this region was probably due to the high prevalence of smoking. In 1965, 64% of Quebec males aged 15 or older regularly smoked cigarettes, as compared with 47% of their counterparts in the Prairie provinces. Current rates of death from lung cancer reflect cumulated exposure to smoking over many years, but no survey data are available before 1965 (Wigle et al., 1986:234; Department of National Health and Welfare, 1980).



CARDIOVASCULAR DISEASE

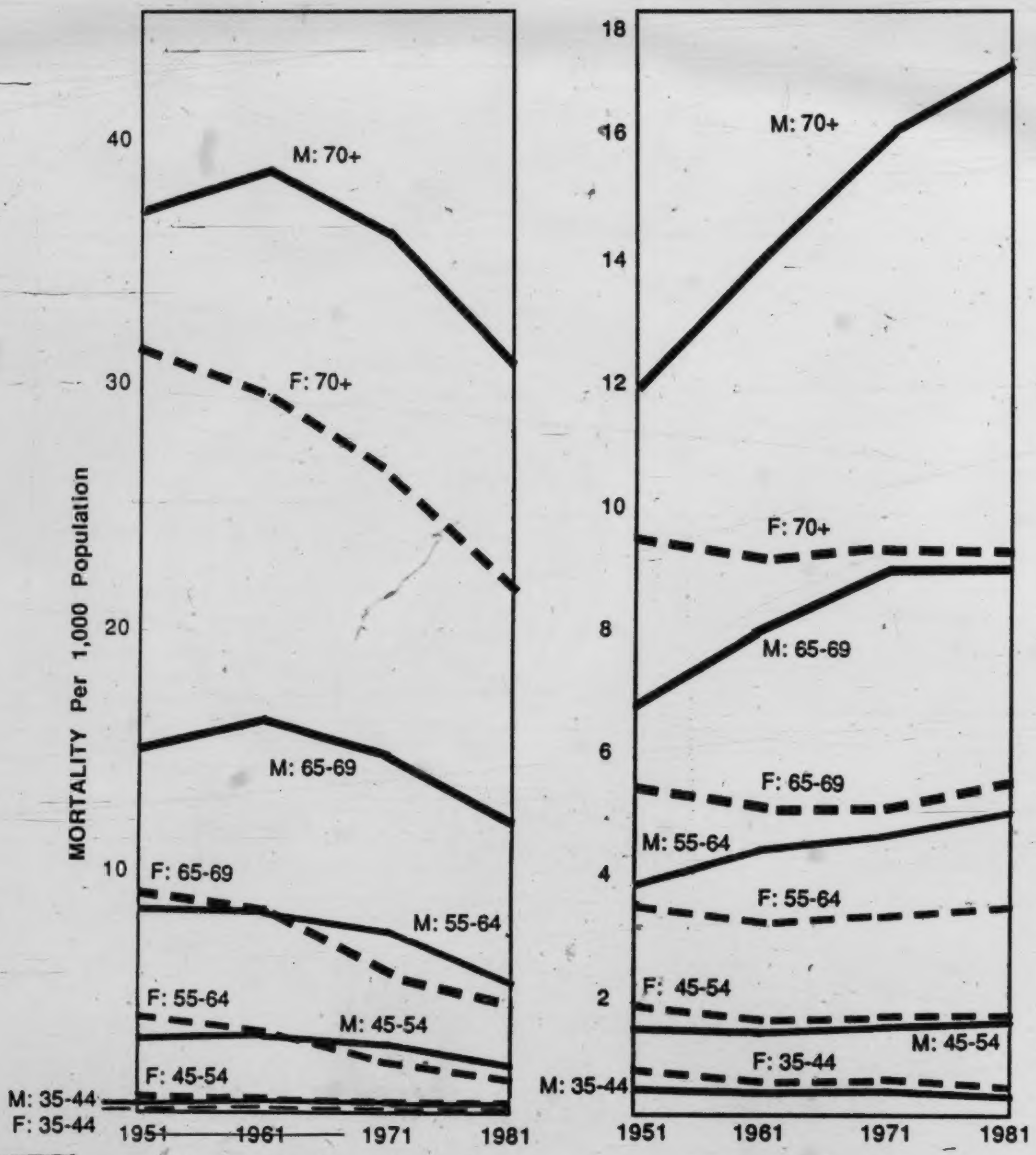
(SOURCE: Table B-6)

MALIGNANT NEOPLASMS

(SOURCE: Table B-7)

FIGURE 4-8

Unstandardized Death Rates for Both Sexes by Cause, Canada and Regions, 35+, 1951-1981.



CARDIOVASCULAR DISEASE
(SOURCE: Table B-6)

MALIGNANT NEOPLASMS
(SOURCE: Table B-7)

FIGURE 4-9

Unstandardized Death Rates for Both Sexes, by Cause, Canada. Various Ages, 1951-1981 decades. By ages 55-64, however, the male death rate from cancer quickly outstrips that of the females', and the two rates widen over time, with the male death rate increasing almost exponentially in most of the regions.[21] If cancer is indeed due to carcinogenic agents in the environment, perhaps women are either able to resist them more (Gee and Veevers, 1983:83), or else their life styles may reflect this difference.

The increased cancer rate for men and at the oldest ages would seem to support evidence that lung cancer (i.e., smoking) is a major cause of death, especially for men (Retherford, 1975, Preston, 1976; Lopez, 1983). In this analysis, there is no proof that the increased rate of cancer for men is indeed due to smoking, but since more men traditionally have smoked than women, and since cancer is believed to be the product of a long period of time of performing unhealthy life styles (like smoking), it would appear logical to assume that life style habits (like smoking), have had a negative effect for men, especially the older men, by their increased cancer rate.[22]

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[21] Wigle (1978:113), in his study of cancer patterns in Canada from 1931 to 1974, discovered that the age standardized cancer rates increased 32% for men (due almost entirely to an increase in lung cancer) and decreased 22% for women.

[22] In a recent longitudinal study in the United States, persons aged 65 to 74 years were analyzed to ascertain whether cigarette smoking retained its adverse effect on survival in an elderly population. Current cigarette smokers had a risk of coronary heart disease mortality 52% higher than non-smokers, ex-smokers or pipe and cigar smokers. The excess risk of mortality declined within one to five years after smoking cessation. The authors proposed that even elderly smokers should be encouraged to quit (Jajich et al.,

Since higher female than male mortality from cancer is evident for the youngest ages from 1951 in all the regions, it does not appear that adoption of a 'masculine sex role' could account for this early, higher female mortality. One of the major cancers for women at earlier ages is breast cancer and this may account for much of the mortality of women at these ages. Many studies demonstrate a protected effect of early age at first birth and find that women over the age of 30 at the time of their first birth have an even greater risk of breast cancer than those who bear no children at all (Kelsey, 1979:75,78; MacMahon et al., 1970; Wigle, 1977). As later child-bearing has been on the increase over the past few decades, the rate of cancer should be increasing for women in these youngest age categories. This does not seem to be the case, however, as the cancer rates are declining for women at these ages.[23] It is suggested that lung cancer, due to a dose-response effect, may displace breast cancer as the leading killer of Canadian women by 1990, thus the trend in malignant neoplasm mortality for women may soon change (Wigle et al., 1986:231; Burbank, 1972:479). More information about specific cancers for women at these age groups is necessary.

In all cases, women's rates of mortality due to cardiovascular disease are lower than males of the same age,

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[22] (cont'd) 1984; Chronic Diseases in Canada, 1985:100).

[23] Associations have been reported between breast cancer, tumors, and cancers of the buccal cavity, pharynx, and thyroid. The actual nature of, and intercorrelations between, the cancers is yet to be clearly understood (Kelsey, 1979:83).

and it has been suggested that hormonal differences protect women from cardiovascular disease (Nathanson, 1984:202). It appears, however that the mortality gap between the sexes is slowly closing, due to a slowing in the decline of the rates of mortality for women, and the increased decline for men, suggesting a life style, rather than biological, change[24] This trend is observed in Figure 4-8, which shows the relative steepness of the declines of death rates between the sexes by Canada and region. This trend will be studied more closely in the next hypothesis through the use of ratios.

In Hypothesis 6, the general unstandardized death rate for women had increased in the British Columbia and Prairies regions between 1961 to 1971 and the question was then raised whether these regions may have been disproportionately affected by some chronic disease. Looking at the statistics related to these regions (Table B-6), one notices that there was a slight increase in the unstandardized cardiovascular death rate for women, for the Prairies only between 1961 and 1971, although the stabilizing (rather than decline) of the rate during this time period in the Prairies region at age 70+ may have contributed to an increase in the general death rates for that region for that age group. No other region for females aged 70+ show an increase or a stabilizing of the cardiovascular death rate during that time period. Also, when the rates are standardized, there is no increase of rates for females for the Prairies or any region between 1961 and 1971.

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[24] There has been increasing rheumatic heart disease mortality for women and a subsequent decline in that disease mortality for men reported in many developed countries (Moriyama, 1983:283). Also, since 1950, increased use of the contraceptive pill for women, particularly with cigarette smoking, has increased mortality due to coronary heart disease (Hertzel, 1983:252-253; Chronic Diseases in Canada, March 1986:89).

Similarly, there is a marked increase in the malignant neoplasm death rates for females aged 70+ between 1961 and 1971 (Table B-7) which occurs in both the Prairies and British Columbia regions and which does not occur to the same degree in any of the other regions.[23] The unstandardized rates support the assumption, then, that the general mortality of women aged 70+ in the Prairies and in British Columbia regions was abnormally affected by increased chronic death rates (mostly malignant neoplasms) during the time period of 1961 and 1971. When standardized, however, the rates display an increase in all of the regions between 1961 and 1971.

In addition, the unstandardized general death rate of males increased for those aged 70+ in the regions of British Columbia, the Atlantic and the Prairies between 1961 and 1971. Examining the corresponding statistics in Tables B-6 and B-7, the reader will see that there were no increases in Canadian mortality during these years for the above mentioned regions, while all the regions displayed a significant increase in death rates due to malignant neoplasm mortality during these years. The increased malignant neoplasm death rates between 1961 and 1971 may have likely affected the increased corresponding general mortality levels in the above regions; however it is suspected that these regions were not influenced abnormally more than were the other regions.

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[23] These results partially support the results from a study of breast cancer rates from 1965 to 1974 for the Canadian regions (Fabia et al., 1977) in which women aged 60 to 64 showed an increased breast cancer death rate in the Prairies (and to a lesser extent, in British Columbia), relative to the other regions. The causes are not clear; Fabia and associates suggest that this cohort may have suffered from insufficient or improper diet due to food shortages during World War II which in turn affected their chances of cancer (Fabia et al., 1977:1137).

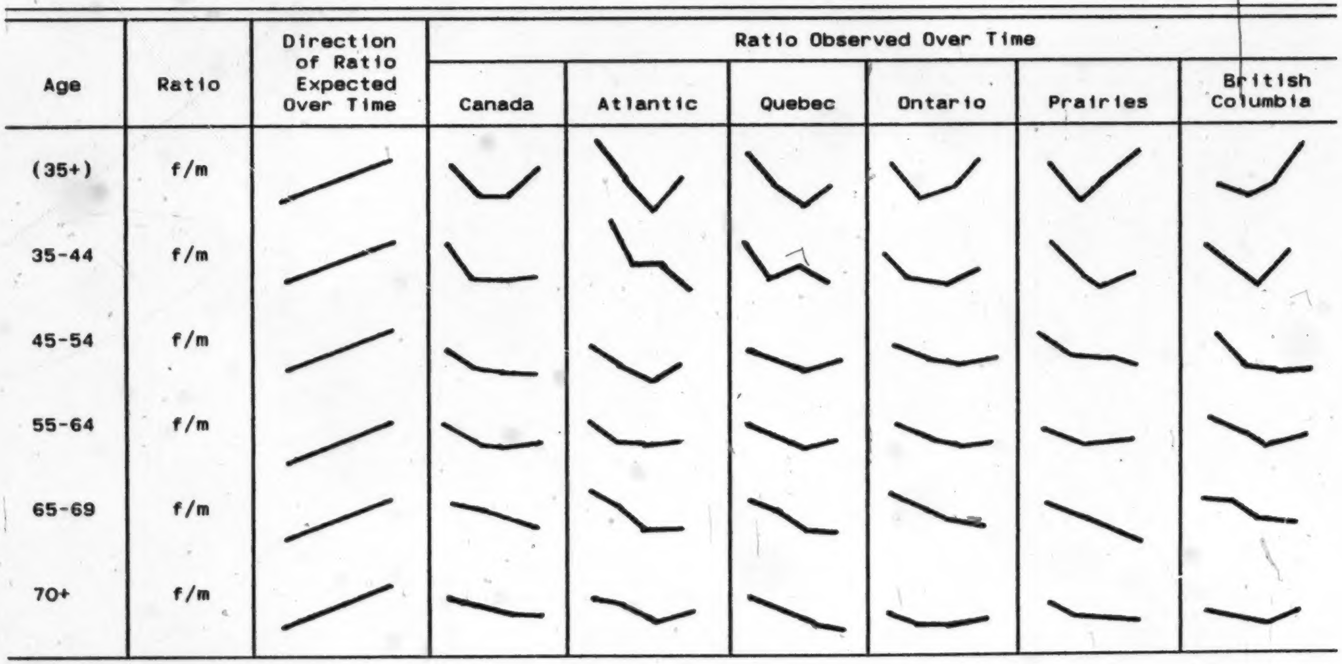
Finally, the rates for men, standardized for age for the Atlantic, Prairies, and British Columbia regions are examined (see Tables B-6 and B-7), since these were the regions singled-out in Hypothesis 6. The results do not support the findings of Hypothesis 6 for these regions since no unusual rise in the rates between 1961 and 1971 exist in these regions which do not exist in the others; in fact, much of the rise in mortality (at least in cardiovascular mortality) occurs betwen 1951 and 1961, and not later as was suggested in the findings of Hypothesis 6. The malignant neoplasm death rates show a regular i~~ncrease for~~ males over most of the time periods, isolating no particular region. Thus, it cannot be assumed that chronic disease was much higher for males in the Atlantic, Prairies, and British Columbia regions particularly during the decade of the '60's.

Hypothesis 8 cannot be supported, as male chronic death rates are not always higher than female's at all ages, as shown in the case for malignant neoplasm mortality. It is the case, however, for cardiovascular disease mortality.

Hy9. It was here hypothesized that the differences between the death rates of cardiovascular disease and malignant neoplasms will be decreasing between men and women over time, due to modernization and life style influences which have recently begun to affect women deleteriously. Examining Figures 4-10 and 4-11 (summaries of Tables B-8 and B-9 in Appendix B), the 'u-shaped pattern' observed in Hypothesis 7 (see Figure 4-7) for general mortality is again observed in these two tables, for both cardiovascular disease mortality and for malignant neoplasm mortality. Hypothesis 9 is thus supported: modernization and life style factors seem to have recently (since 1971) affected the female-male ratio of the chronic diseases overall, as indicated by the expanding and then narrowing of the differences of the chronic death rates between the sexes. The expanding ratio indicates the negative effects modernization and life style have had on males, due to the male's higher rate of mortality; while the recent narrowing of the ratio indicates modernization and life styles' negative effects on females due to the slowing in the decline in their rates of mortality.

FIGURE 4-10

Female to Male Cardiovascular Disease Mortality Ratio (f/m)⁽¹⁾, for Various Ages, Canada and Provinces, 1951-1981

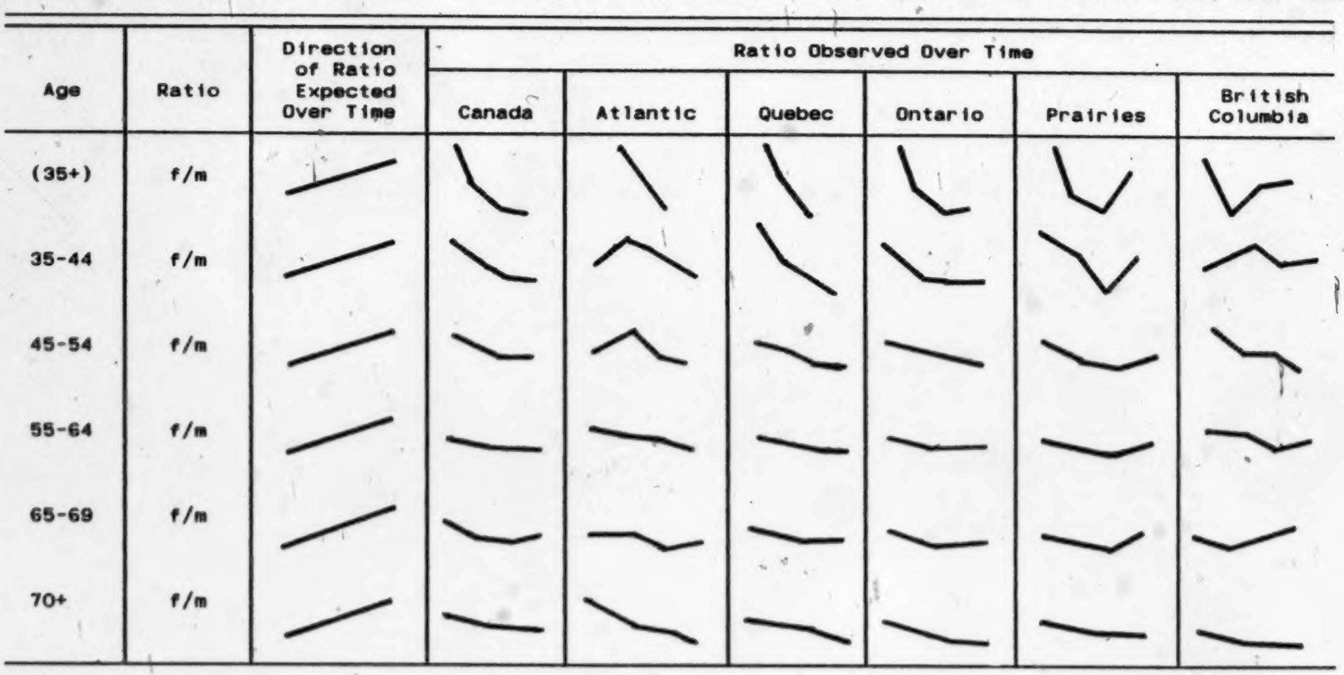


[1] f/m = Female cardiovascular disease death rate, for age group and year/male cardiovascular disease death rate for age group and year X 100.

SOURCE: Table B-8.

FIGURE 4-11

Female to Male Malignant Neoplams Mortality Ratio (f/m)''', for Various Ages, Canada and Provinces, 1951-1981



'''f/m = Female malignant neoplasm death rate, for age group and year/male malignant neoplasm death rate for age group and year, X 100.

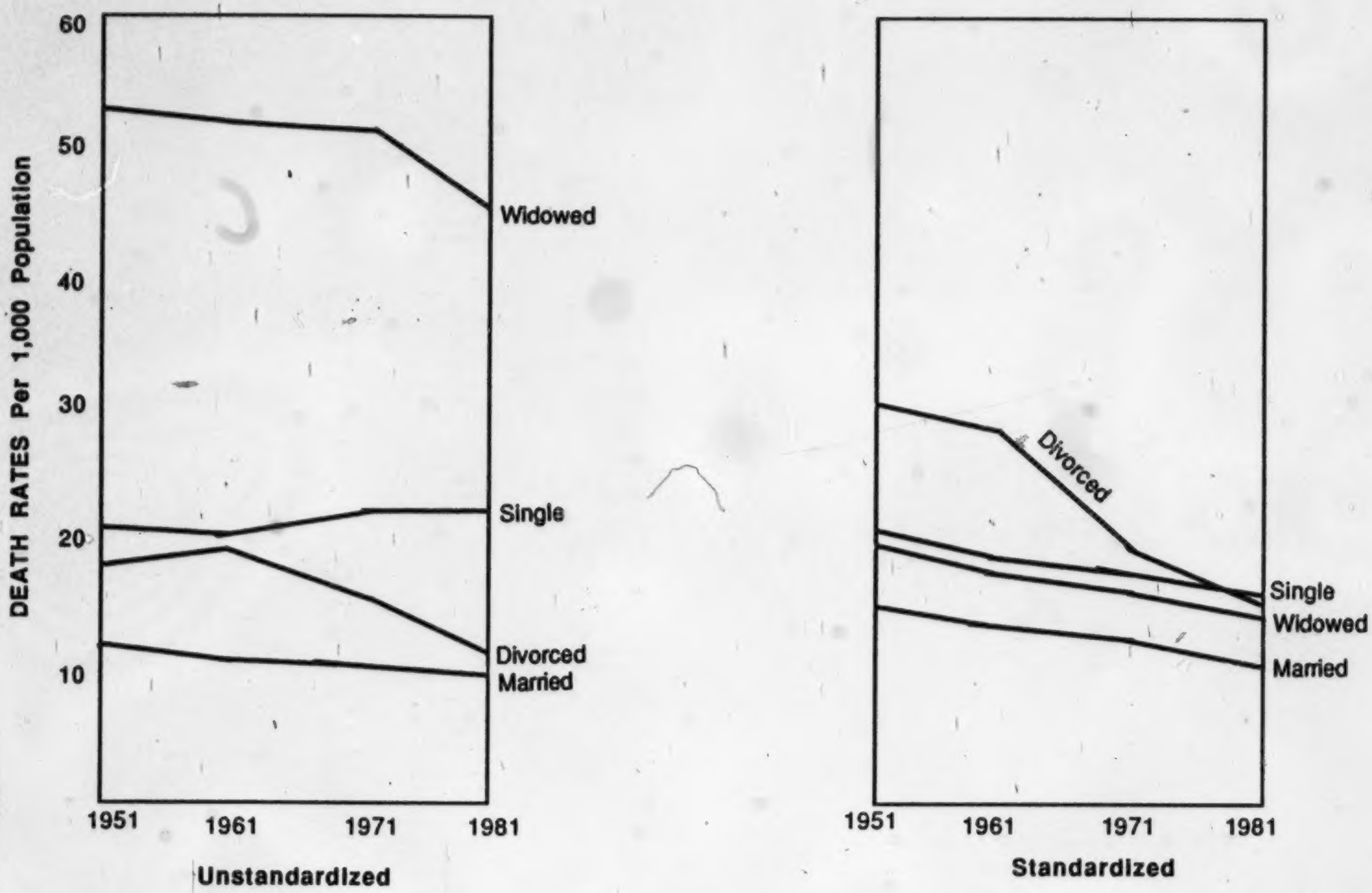
SOURCE: Table B-9.

Cardiovascular mortality ratios (Figure 4-10) are beginning to support the hypothesis in every region. The oldest ages show an overall continued decline, but this can perhaps be expected as people at these ages are rarely still working outside the home, especially women, so the effects of modernization and life style should be minimal, compared to earlier ages.

Similarly, the malignant neoplasm mortality ratio (Figure 4-11) illustrates a narrowing of rates between the sexes, but this fact is not quite as obvious as for Figures 4-7 and 4-10 (general mortality and cardiovascular mortality). Similar to Figure 4-7, the Atlantic and Quebec regions seem to lag behind the other regions in Canada in demonstrating a narrowing of death rates between the sexes, illustrating perhaps, another example of 'culture lag'.

As suggested in Hypothesis 8, the decline in the ratio is the result of continued, steep death rate decline for males rather than females, supporting the hypothesis that life style changes overall have begun to negatively affect females as illustrated by their slowed decline of death rates.

Hy10. This hypothesis attempts to test the usual assumption of life insurance companies that death rates vary with marital status, and vary from lowest to highest by married, single, widowed, and divorced. Figure 4-12 (and Table B-10 in Appendix B) supports some of this claim.



(SOURCE: Table B-10)

FIGURE 4-12

Unstandardized and Standardized General Death Rates by Marital Status, Canada, 1951-1981; 35+

In Canada and in all the regions, those married had lower death rates than those not married, with the exception of Quebec, where the divorced had a lower unstandardized death rate than the married, in 1981. The standardized death rate, however, did not show this conflict and the standardized death rate for those married was clearly lower than the standardized death rate for the divorced.

For the order of the lowest to highest rates for the unmarried, the picture is less clear. In all cases in the unstandardized death rates, those widowed had the highest rates of mortality and the rate of the divorced was the lowest. The standardized rate for the unmarried shows that those who were widowed actually had the lowest rates, with those divorced having the highest rate; but by 1981, the rate of the divorced frequently drops below the death rate of those who were single (except for Quebec and Ontario).

The results are interesting in that they show the extreme changes in the mortality of the divorced. With the liberalizing of the divorce laws in 1968 in Canada, there seems to be a great decline in the death rate of those divorced between 1961 and 1971. It would be interesting to determine whether the rates were already dramatically declining prior to 1968 or whether this decline occured mostly after 1968. (Examining the 1966 death rates of the divorced would likely give a clue to this answer.) This decline occurs in all the unstandardized and standardized rates in the regions except for Quebec, where the decline occurs after 1971 (again, a 'culture lag' effect occurs, due perhaps to the strong Catholic leaning of the region?) Also, if this liberalizing of the divorce laws *had* such a dramatic effect on lowering the mortality of those divorced, it would provide support for indicating the important effect that one's social acceptance has on one's mortality. That is to say, once divorce became more 'acceptable' after 1968, perhaps those who were divorced at that time or since felt a greater acceptance into the community and responded less as social outcasts.[34] With 'anomie' being thus lowered, it may have had more of the effect that marriage is considered to have; that is, a sense of protection and inclusion. Widowed persons are generally more accepted by society than are divorced persons, and the reasons the unstandardized death rates are so high for the widowed is due to the fact that more people are widowed late in life when the chances of dying are also the highest. When these rates are standardized for the compounding effects of age and sex, those widowed have the lowest rates of death, next to those married.

In summary, this hypothesis cannot be supported, since the order of the marital statuses by rates of death are different than what was generally assumed. The lowest rate, those married, is consistent with the assumption, but nothing else is. Widowed or divorced vie for second place as lowest in mortality, depending upon whether the rates are standardized; highest rates belong to widowed, single, or divorced, depending upon (again), type of rate and also with region.

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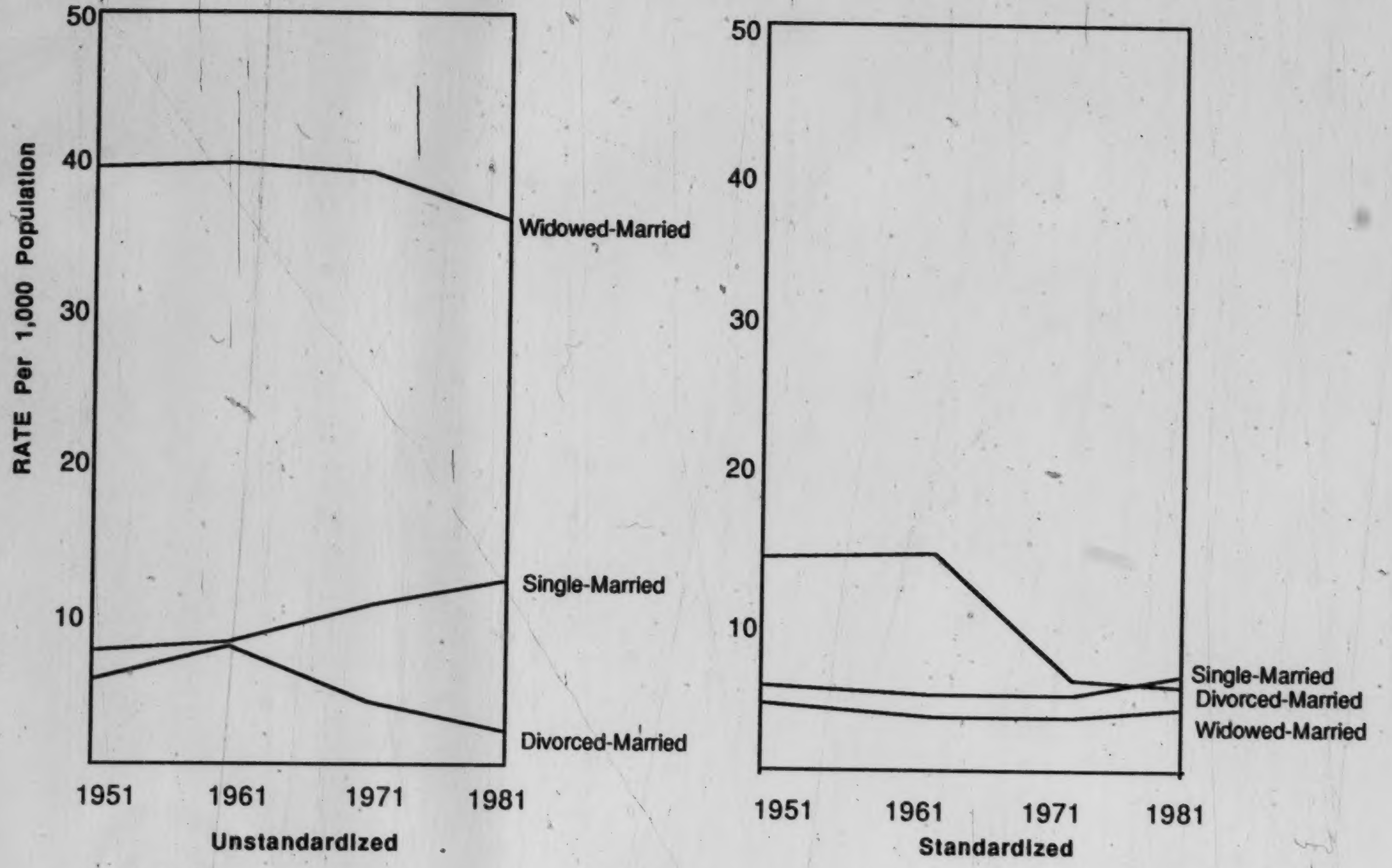
[34] Mergenhagen and associates (1985) write that the "stigma attached to divorce appears to have weakened, if not disappeared, while support groups and specialized organizations have been developed to facilitate the social integration of divorced individuals. Such trends raise the question of whether marital status mortality differentials have shifted as well" (p.53).

Hy11. Gove (1973), and Kobrin and Hendershot (1977) suggest that due to a protection element of marriage, those who are married should have a lower death rate than those not married. As seen in the previous Figure 4-12 and Table B-10, those married indeed have lower death rates in all of the standardized cases, and all but one of the unstandardized cases (but the amount is insignificant). Thus, Kobrin and Hendershots' argument of the protection theory of marriage for general mortality is supported in the Canadian case.

The differences in the death rates of the non-married and married over time are interesting to note, especially when the rates are standardized with regard to age and sex (see Figure 4-13, and Table B-11 in Appendix B). The rate of mortality of those who were widowed, with regard to those who were married, has changed very little over time. The rate of mortality of singles (in comparison to marrieds) has been slowly increasing while the death rate of those divorced has been generally declining. This is even more apparent in the unstandardized cases. Why this is the case



(SOURCE: Table B-11)

FIGURE 4-13

Unstandardized and Standardized General Death Rates of Married Vs. Unmarried, 35+ Canada, 1951-1981 is difficult to determine, but it may have something to do with the roles of singles and divorced in our society.[37] It is as though singles are becoming more alienated from society (as indicated by the increasing death rate), while the divorced are becoming more accepted (as indicated by the declining death rate), relatively speaking.

The next hypothesis deals with the sexes within marital status, and perhaps this will add some helpful information.

Hy12. Further to Hypothesis 11, it is suggested that men benefit more from marriage than women (Gove, 1973). It was hypothesized that if the difference between the general death rate of married men and non-married men is greater than the difference between the general death rate of married women to non-married women, then the protection effect of marriage as benefitting men more than women will be supported.

Figure 4-14 (and Table B-13 in Appendix B) illustrate the graphed differences in mortality between the sexes according to marital status. In almost all cases, the rates for unmarried males is higher than for unmarried females (after subtracting rates from married males and females,

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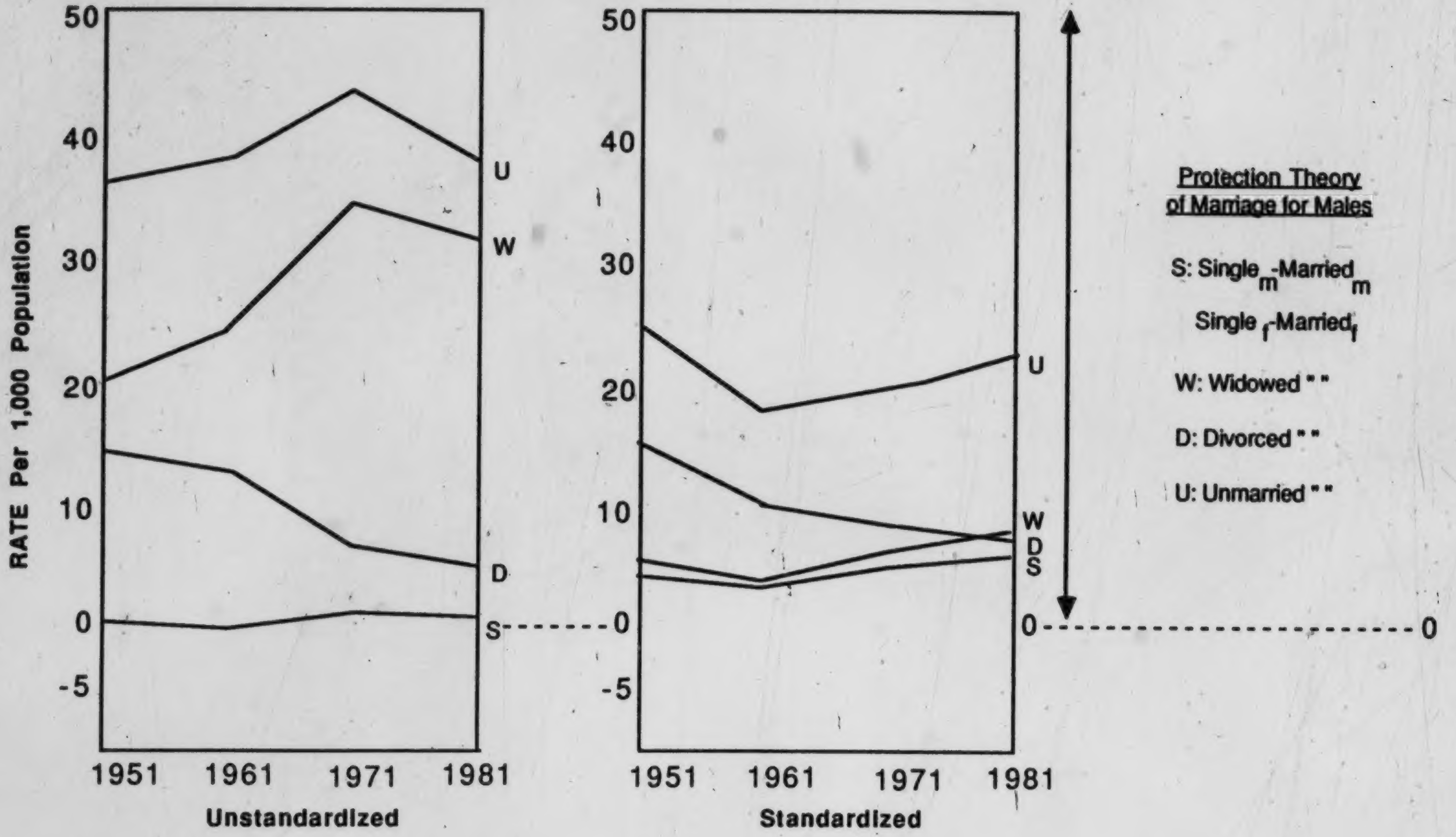
[37] Mergenhagen and associates (1985) suggest that the relative mortality positions of divorced and widowed persons, for instance, may have changed due to a compositional effect or in the 'demographic' profiles of the divorced and widowed groups. Changes in the roles and life styles associated with these marital statuses may also have affected changes in mortality (p.54). Perhaps the disadvantage of the unmarried status in general is being dissipated as it becomes more 'normal' (Yaukey, 1985:135).



(SOURCE: Table B-13)

FIGURE 4-14

The Difference in General Death Rates (Unstandardized and Standardized) Between Unmarried and Married Men, and Unmarried and Married Women, 35+, 1951-1981, Canada.

respectively), supporting the 'protection' hypothesis of marriage for males.

Any graphed point above zero in Figure 4-14 supports the hypothesis that men benefit more from marriage than females, as zero represents a dividing line between the two rates. Thus, if the difference between unmarried men and married men versus unmarried women and married women is less than zero, then it would appear that women benefit more from marriage than do males. Thus,

$$GDR^{u}_{M} - GDR^{m}_{M} > GDR^{u}_{F} - GDR^{m}_{F} = \text{'protection in marriage for men'}$$

where GDR^{u}_{M} means general death rate of unmarried males, GDR^{m}_{M} is the general death rate of married males, GDR^{u}_{F} is the general death rate of unmarried females, and GDR^{m}_{F} is the general death rate of married females. Conversely, if the amount is LESS, then there is greater protection in marriage for women.

For example, higher protection in marriage for females might appear to be the situation in the Atlantic and Ontario regions, where the unstandardized death rates for single women are higher than for single men (subtracted from the married rates). But in both cases, when these rates are standardized for age, the females' rates are no longer significant or higher than the males' rates, thus the results continue to support the overall hypothesis of higher protection in marriage from death for males.

In connection with Hypothesis 11, the differences between the rates of the unmarried and the rates of the married are examined over time, with the conclusion that the rate of mortality for singles was slowly widening from the married' rates, while the divorced' rate was decreasing, and the widowed' rate staying generally the same. When analyzing these same trends with regard to sex, some interesting things are noticed (see Table B-12). For instance, in the mortality of singles, it is primarily the male's rates which are increasing, relative to the female's, which implies that single males would have gained more of the benefits of marriage (i.e., reduced mortality), than would single women (this was especially noted in the cases of the Atlantic and Ontario regions). Similarly, rates of widowed males are increasing more over time than are those of the widowed females, again implying that widowed males lose more protection by not being married than do widowed females. This is reminiscent of the quote from Durkheim in Chapter 2 which proposed that women have less need of marriage than men (1951:274-275).[31] This also suggests that the protective effect of marriage against stress is smaller for women than for men (Eyer and Sterling, 1977:6).

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[31] It has been proposed that men are more dependent for their emotional well-being on the social ties afforded by marriage, and that these social ties are less satisfactory to women than to men, and that women have more alternative ties outside of marriage that they can fall back upon. For instance, women may respond to the presence or absence of social ties outside of marriage in the same way that men respond to marriage itself (Nathanson, 1984:208). Also, with recent demographic changes in society, the share of marriage and children in women's lives is reduced, leading women to attach less importance to their domestic role thus reducing their dependence in and on marriage (Davis and van den

The pattern of those divorced is less clear. The death rate for males (relative to those married) is higher than for females, and except for Quebec and the Prairies region, the rates for divorced males and females generally parallel each other. In Quebec, the divorce death rates for both males and females (relative to those married), is declining dramatically, and even more so for males than for females (see Table B-12). Quebec is considered a predominantly Catholic region, whose religion sanctions against divorce. With the divorce law changes in 1968, it appears that a minor 'moral revolution' has occured which may in turn have reduced the social stigma related to divorce. Altering the social isolation that those divorced may have felt could have had the end-effect of decreased mortality. In the Prairies region, the rates for women are declining (see Table B-12), while the rates for men are increasing since 1961. This may reflect differing friendship networks of the sexes: females may be feeling less social isolation from divorce while men may be experienceing increasing stigma due to a smaller or perhaps more shallow network of friends. Regardless, the recent changes in the divorce law seem to affect changes in the mortality of those divorced.

In summary, in order to determine whether unmarried men or unmarried women would have potentially gained or lost the

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[28](cont'd) Oever, 1982:508).

protection aspect of marriage (relative to the marrieds), it is helpful to examine the distance the point of mortality is from the zero line in Figure 4-14. The higher the point is above zero, the more unmarried men would have benefitted from marriage, through lowered mortality. The lower the point is below zero, the more unmarried women would have benefitted from marriage. The standardized rates illustrate the trends more clearly since the affects of age are removed. We see for Canada, overall, that the unmarried men are increasingly losing more and more of the potential benefits of marriage due to their increasing death rates over time. This means that if they had been married, they would have reduced their risk of death substantially. Thus, in relation to women, the evidence suggests that single men would gain more from marriage than would single women. This appears to be the case largely for widowed and single men. The mortality for divorced men (relative to married men) in Canada, however, is declining over time (in relation to the difference between divorced and married women), implying that divorced men would have potentially gained increasingly less from marriage than divorced women, over time, had they been married at the time of their death. These findings are consistent with most of the regions in Canada. Overall, it would appear that the social stigma related to divorce, especially for men, has decreased with the changing of the divorce laws in Canada in 1968. This seems to translate as lowering mortality over time for divorced men versus divorced women (relative to those married).

Gove's (1973) theory that married men benefit from marriage more than married women, with regard to general mortality, is supported by the findings.

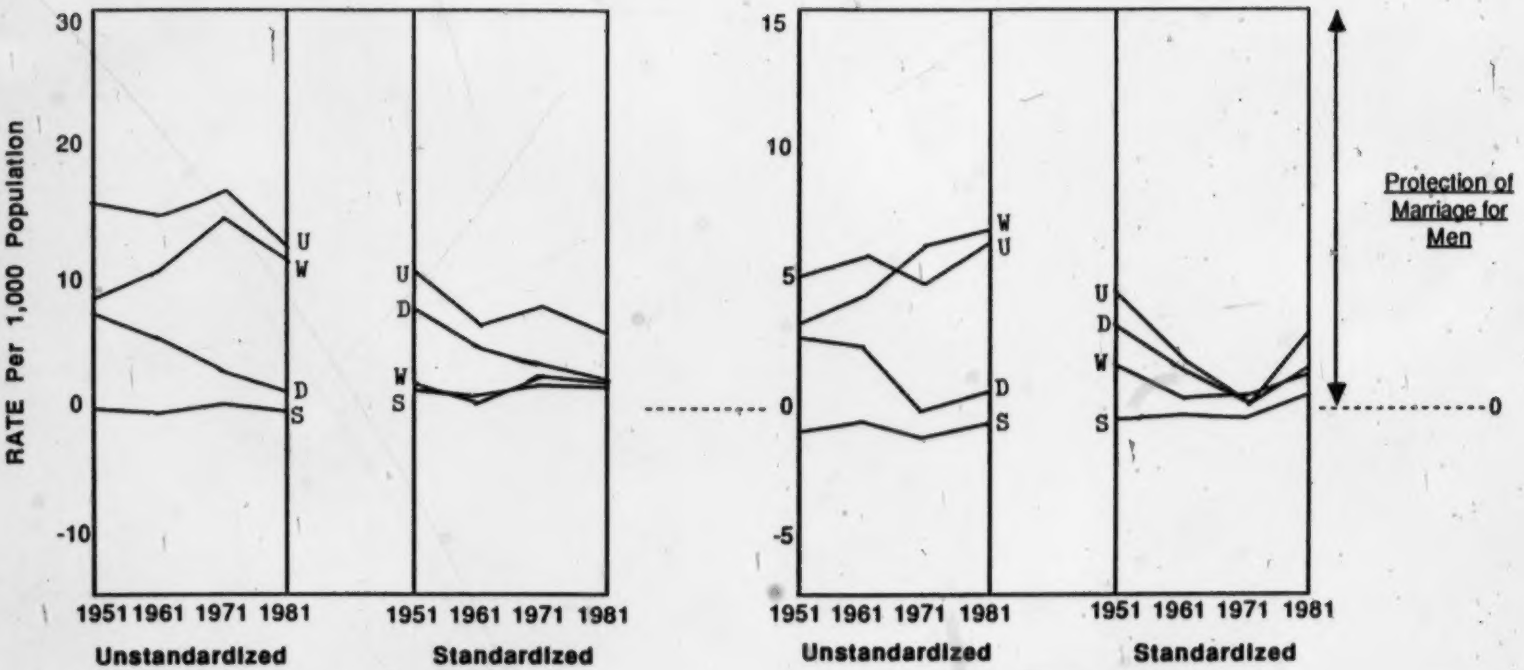
Hy13. Marital condition appears to be related to different causes of mortality (see Chapter 2), thus in an attempt to study the universality of Gove's and Kobrin and Hendershot's 'protection' theory of marriage, it has been hypothesized that the death rates from chronic disease mortality (cardiovascular disease and malignant neoplasms) of those married will be lower than those not married.

From examining Tables B-14 and B-17, it is noted that except for Quebec, the death rates of those married is consistently lower than for those widowed, single, or divorced. For Quebec, the unstandardized death rate of the divorced for cardiovascular disease, in 1961 and 1981, is lower than the rate for those married; similarly, this is the case for malignant neoplasms in 1981. For both types of mortality in 1981, however, the standardized rate corrects any compounding effect of age or sex, and illustrates that the rate of those married is indeed lower than the rate of those divorced. In 1961, both the unstandardized and standardized rate for the divorced is lower than for the married, however the amount of the difference, when standardized, is negligible (.05 per 1,000 population), thus does not represent an exception to the overall trend.

Therefore, Hypothesis 13 (i.e., the protection aspect of marriage) is thus supported by the data.

When Tables B-14 and B-17 are re-examined with regard to marital status and sex in an attempt to determine whether males benefit from marriage more than females (Gove, 1973), some interesting patterns emerge. Cardiovascular disease mortality (Figure 4-15) shows a similar trend in unmarried vs. married mortality for gender which is found for general mortality (Hypothesis 12 and Figure 4-14). Except for the standardized rates, the mortality of the unmarried men (as compared to married men, and unmarried and married women) shows a decline after 1971 for cardiovascular disease that is not present for general mortality. This decline after 1971 for cardiovascular disease illustrates that had the unmarried men who died after 1971 been married, they would have potentially had benefitted less and less from the protective elements of marriage due to their declining death rates. Alternatively, the converse is true of malignant neoplasms. After 1971, the death rates have increased for those men of unmarried statuses, suggesting that if they had been married, these unmarried men would have, over time, enjoyed the potential benefits of marriage as manifested through lower death rates. (This 'u-shaped' mortality curve of rates has been discussed in Hypotheses 7 and 9.)

The mortality of single males (relative to married males) is below the zero line marking the protection of marriage for men in the unstandardized cardiovascular death



CARDIOVASCULAR DISEASE

(SOURCE: Table B-16)

MALIGNANT NEOPLASMS

(SOURCE: Table B-19)

FIGURE 4-15

The difference of Death Rates (Unstandardized and Standardized) Between Unmarried and Married Men, and Unmarried and Married Women, Due to Chronic Diseases, 35+, 1951-1981, Canada.

rates, and the standardized and unstandardized rates for malignant neoplasm mortality. This means that single women would have benefitted more from marriage (relative to married women and single and married men). This fact renders false Gove's (1973) theory of the higher protection aspect of marriage for men. This higher mortality for single females hold true in many of the regions as well (see Tables B-16 and B-19).

Similarly, standardized cardiovascular disease death rates for divorced females was higher (relative to married females) than that of divorced males (relative to married males) in the Atlantic region prior to 1981.

With regard to malignant neoplasm mortality, higher mortality for single females (both standardized and unstandardized) is also apparent, indicating a higher protection aspect of marriage for women.

In summary, as explained in Hypothesis 12, any graphed point above zero illustrates that the rate of mortality for unmarried men (in relation to married men) is higher than the rate of the mortality of unmarried women (in relation to married women), illustrating the greater protective aspects of marriage for men than women. For cardiovascular disease, this is generally the case for Canada and the regions, and the overall trend is a declining one since 1971, illustrating that unmarried men would have gained potentially less and less of the protective aspects of marriage. This is especially the case in the Atlantic, Ontario and Prairies regions where the graphed point slips below the zero mark, indicating periodically higher divorced and single female mortality. For malignant neoplasm mortality as well, single males often have lower mortality than single females (relative to those married).

If these exceptions prove to be statistically significant (to be explored in Chapter 5), then these findings will disprove Gove's theory of the protection aspect of marriage for men for chronic disease mortality, when mortality by sex is examined separately.

V. REGRESSION ANALYSIS OF THE HYPOTHESES

In Chapter 4, a descriptive analysis of the hypotheses developed in Chapter 2 was accomplished through the use of rates and figures. In this chapter, these same hypotheses will be submitted to multiple regression analysis (see Chapter 3). Where appropriate, the natural scale of the dependent variable will be modeled, but if the data are not linear, then the logarithm of the dependent variable is taken. Whenever heteroscedasticity is discovered (from the inspection of partial plots in the SPSSx output), a weight[11] will be applied to compensate for the uneven scatter around the regression slopes. Region will be used as a control or predictor variable if deemed appropriate for the particular hypothesis.

The Hypotheses: Results

It is felt that Hypotheses 1 and 2 were discussed sufficiently by the use of rates in Chapter 4. Thus, they will be omitted in the analysis of this chapter.

Hy3. In Chapter 4, the hypothesis of mortality compression accounting for a decline in chronic death rates at the earlier ages over time (Olshansky and Ault, 1986) was not supported due to overall rate decline in chronic disease mortality and in cardiovascular disease mortality. It however seemed to hold true for malignant neoplasm mortality. After analyzing Tables 5-1 through 5-3, it will be shown that the results of the regression are different than the findings in Chapter 4.

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[11] For the weight formula used, see the footnote in Table 5-1.

The data were initially observed to represent a non-linear pattern, thus the logarithm of the death rate was applied. Also, a weight was required to control for heteroscedasticity.[30] The application of weighted regression may result in an inflated R^2. This must be considered when interpreting the overall variance explained by the equation. When the equations were regressed on time, and the effects of sex and marital status were held constant, with age being adopted as a conditioning variable in the initial analyses, an inflated R^2 appeared to be the result: 77% (chronic diseases in 1951) to 88% (malignant neoplasm mortality in 1971) of the variance can be explained by the equations used. Without the weight factor, the explained variance ranged from 19% (malignant neoplasms in 1951) to 85% (cardiovascular disease mortality in 1981).[31] The results were almost all significant.

In Table 5-1, the logarithm of the death rate for cardiovascular disease mortality shows a decrease in mortality in each age group over time. The decline, however, is increasingly less for the oldest ages than for the youngest ages, as indicated by the slopes: b=-.754 for ages

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[30] This weight compensates for an uneven variance around the regression slope.
[31] Not shown in thesis.

TABLE 5-1

Regression of the Logarithm of the Cardiovascular Disease Death Rate on Sex(1), Year, and Marital Status, Conditioning for Age, Canada(2)

	35-44				45-54				55-64			
	r(3)	b	B	t	r	b	B	t	r	b	B	t
S1(F)	-.66	-1.232**	-.69	-54.86	-.84	-1.353**	-.86	-132.05	-.82	-1.094**	-.85	-162.16
Y1(61)	.08	-.246**	-.13	-8.33	.07	-.077**	-.04	-5.50	.10	-.123**	-.08	-13.01
Y2(71)	-.06	-.478**	-.24	-15.86	-.00	-.226**	-.13	-16.29	-.02	-.284**	-.20	-30.64
Y3(81)	-.21	-.754**	-.38	-24.86	-.16	-.470**	-.27	-33.35	-.26	-.533**	-.37	-57.38
M1(S)	.27	.645**	.33	25.75	.19	.385**	.21	31.47	.12	.254**	.16	29.70
M2(W)	.07	.730**	.22	17.17	.02	.476**	.21	31.77	.02	.349**	.22	40.44
M3(D)	.22	.904**	.32	24.50	.18	.709**	.28	41.53	.17	.555**	.24	44.49
a	--	-.086**	--	-3.50	--	1.172**	--	101.15	--	2.224**	--	283.97
ln($\overline{X}$)		-.57				.71				1.72		
ln(SD)		.86				.75				.63		
R²		.71				.86				.86		
R²adj.		.71				.86				.86		
N		1,893				3,474				5,326		

*p≤.05
**p≤.01

TABLE 5-1
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
S1(F)	-.78	-.818**	-.81	-118.01	-.55	-.463**	-.67	-155.58
Y1(61)	.16	.006	.01	.61	.17	-.002	-.00	-.46
Y2(71)	-.03	-.186**	-.16	-19.06	.01	-.095**	-.12	-22.15
Y3(81)	-.28	-.395**	-.35	-41.06	-.31	-.262**	-.34	-61.99
M1(S)	.10	.174**	.14	19.08	.07	.323**	.37	78.70
M2(W)	.01	.236**	.21	28.49	.46	.530**	.75	156.15
M3(D)	.16	.451**	.22	30.86	-.01	.276**	.16	35.76
a	--	2.774**	--	332.97	--	3.460**	--	890.43
ln($\overline{X}$)		2.39				3.41		
ln(SD)		.50				.35		
R'		.79				.83		
R'adj.		.79				.83		
N		4,716				9,438		

'''Variables are converted to dummy variables. For sex, S1(F): 0=male, 1=female. For year, Y1(61): 0=1951, 1=1961; Y2(71): 0=1951, 1=1971. Y3(81): 0=1951, 1=1981. For marital status, M1(S): 0=married, 1=single; M2(W): 0=married, 1=widowed; M3(D): 0=married, 1=divorced.

'''The equation is weighted. The formula is: $w_i = \sqrt{(\text{mortality rate}_i/1{,}000 \times \text{pop}_i)} \times (1-\text{mortality rate}_i/1{,}000)$.

'''Statistics used: r = regression coefficient; b = slope; B = beta; t = 't-test', or significance test; a= intercept or constant; ln($\overline{x}$) = logarithm of the mean; ln(SD) = logarithm of the standard deviation; R' = coefficient of multiple determination; R' adj is the R' adjusted; and N = the number of cases.

TABLE 5-2

Regression of the Logarithm of the Malignant Neoplasm Death Rate on Sex, Year, and Marital Status, Conditioning for Age, Canada[1]

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	.33	.310**	.31	17.22	.13	.075**	.12	8.65	-.48	-.286**	-.52	-53.39
Y1(61)	.00	-.024	-.02	-.92	-.05	-.034**	-.05	-2.68	-.14	-.033**	-.05	-3.99
Y2(71)	.04	.001	.00	.04	-.01	-.010	-.01	-.76	.01	.045**	.07	5.74
Y3(81)	-.09	-.147**	-.13	-5.78	.05	.003	.00	.23	.18	.103**	.17	13.58
M1(S)	.14	.335**	.28	15.31	.28	.343**	.44	31.33	.22	.258**	.37	36.79
M2(W)	.27	.572**	.32	17.28	.25	.354**	.39	27.56	.18	.281**	.41	40.32
M3(D)	.29	.656**	.40	21.32	.32	.484**	.45	31.93	.29	.387**	.38	37.86
a	--	-.873**	--	-38.43	--	.357**	--	32.30	--	1.390**	--	202.12
$\ln(\bar{X})$			-.60				.55				1.43	
ln(SD)			.50				.32				.28	
R^2			.36				.38				.55	
R^2adj.			.35				.38				.55	
N			2,036				3,424				4,848	

$^*p \leq .05$
$^{**}p \leq .01$

[1] Regression equation is weighted. For formula, see Table 5-1.

TABLE 5-2
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
S1(F)	-.69	-.487**	-.71	-70.27	-.75	-.549**	-.80	-127.21
Y1(61)	-.07	.037**	.05	3.53	-.05	.087**	.11	13.15
Y2(71)	.08	.117**	.15	11.58	.05	.149**	.19	23.27
Y3(81)	.09	.120**	.16	12.29	.15	.196**	.27	31.54
M1(S)	.03	.099**	.11	10.70	-.01	.134**	.15	22.39
M2(W)	-.02	.148**	.19	17.66	.10	.239**	.34	48.48
M3(D)	.32	.457**	.33	31.91	.23	.419**	.26	40.08
a	--	1.993**	--	226.64	--	2.498**	--	431.46
ln($\overline{X}$)			1.93				2.50	
ln(SD)			.34				.34	
R'			.62				.74	
R'adj.			.62				.74	
N			3,898				6,776	

For a definition of statistics used, see Table 5-1.

TABLE 5-3

Regression of the Logarithm of the Chronic(1) Death Rate on Sex, Year, and Marital Status, Conditioning for Age, Canada(2)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	-.26	-.376**	-.27	-19.85	-.51	-.618**	-.53	-56.43	-.67	-.719**	-.70	-106.63
Y1(61)	.05	-.108**	-.07	-4.06	.03	-.050**	-.04	-3.14	.04	-.087**	-.07	-8.83
Y2(71)	-.02	-.211**	-.13	-7.89	-.01	-.108**	-.08	-6.92	-.01	-.140**	-.12	-14.69
Y3(81)	-.15	-.417**	-.26	-15.63	-.10	-.225**	-.17	-14.39	-.13	-.240**	-.21	-25.39
M1(S)	.22	.476**	.30	21.10	.20	.371**	.26	27.08	.14	.258**	.20	29.70
M2(W)	.14	.651**	.25	18.04	.08	.403**	.24	24.52	.05	.315**	.25	36.12
M3(D)	.24	.801**	.35	24.69	.21	.585**	.29	30.70	.18	.482**	.25	37.98
a	--	-.450**	--	-19.88	--	.816**	--	61.10	--	1.865**	--	226.67
$\ln(\overline{X})$			-.56				.63				1.58	
ln(SD)			.70				.59				.51	
R^2			.29				.42				.58	
R^2adj.			.29				.41				.58	
N			3,929				6,897				10,174	

*p≤.05
**p≤.01

TABLE 5-3
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
S1(F)	-.67	-.680**	-.68	-91.39	-.36	-.474**	-.42	-59.99
Y1(61)	.08	.014	.01	1.27	.06	.022	.02	1.89
Y2(71)	.00	-.071**	-.06	-6.70	.01	-.019	-.02	-1.63
Y3(81)	-.14	-.184**	-.17	-17.72	-.09	-.105**	-.09	-9.37
M1(S)	.07	.144**	.11	14.58	.03	.250**	.17	22.97
M2(W)	.00	.199**	.18	22.21	.20	.417**	.36	46.26
M3(D)	.19	.453**	.22	29.14	.04	.324**	.12	16.26
a	--	2.446**	--	266.99	--	3.066**	--	294.20
$\ln(\overline{X})$			2.18				3.03	
ln(SD)			.49				.57	
R'			.53				.24	
R'adj.			.53				.24	
N			8,613				16,214	

'''Includes cardiovascular disease mortality and malignant neoplasm mortality. See Tables 5-1 and 5-2.

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Table 5-1.

35-44 in 1981, while b=-.262 for ages 70+ in 1981. It thus appears that mortality compression (i.e., an expectation of increase of death rates at the older ages, due to a decline in death rates at the younger ages) is taking place for cardiovascular disease.

For malignant neoplasm mortality, the results are more marked. In Table 5-2, the logarithm of the malignant neoplasm death rate shows a decrease in mortality by age over time for the youngest age group (35-44), a levelling of the mortality rate for the next oldest age (45-54) by 1981, and an increase in mortality in the oldest age groups after 1961. This shows support for Hypothesis 4, and also shows support for Fries' theory of mortality compression at the older ages due to a decrease in mortality at the younger ages.

When chronic mortality is examined, the results are a composite of cardiovascular mortality and malignant neoplasm death trends. In Table 5-3, the logarithm of the chronic death rate for age is decreasing over time for the youngest ages (cardiovascular disease and malignant neoplasm mortality combined) and decreasing at the older ages until 1961, at which point the mortality almost appears to stabilize. The results of chronic disease mortality may indeed be an artificial effect produced by combining opposing trends of two very different diseases.

The findings in the Tables 5-1 to 5-3 only partially support the conclusions reached in Chapter 4 with the application of ASDR. The results from this analysis provide support, overall, for Fries' hypothesis of mortality compression at later ages for chronic diseases. Again, the results of malignant neoplasm mortality over time clearly support the concept of mortality compression, while the results of cardiovascular disease mortality and chronic disease mortality in general, less clearly support (but nevertheless, DO support) the hypothesised assumptions.

These results leads one to speculate whether there are further stages in the compression theory--perhaps ending the concept of premature mortality. That is to say, perhaps continued compression may lead eventually to 'natural' mortality at advanced ages.

Hy4. This hypothesis predicts that life style is a major influence on chronic mortality at the younger age groups (Weatherby et al., 1983:28).

The dependent variable, a ratio of chronic disease mortality to the general death rate, is regressed on time and sex[32], conditioning on specific age groups. Traces of heteroscedasticity were not found in preliminary runs of the data, so a weight was not needed. Also, the fit of the data to the regression line was reasonably linear, so a logarithmic transformation of the dependent variable was not necessary.

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[32] It is believed that by including sex in the equation, although not specified in the hypothesis, confounding effects of gender will be reduced.

The results, in Tables 5-4 through 5-6, confirm the preliminary findings in Chapter 4 for this hypothesis. The decline in the ratio of cardiovascular disease death rates to general death rates (Table 5-4) reject the supposition in Hypothesis 4 that negative life style influences increase cardiovascular mortality over time at the youngest age groups. The b coefficient shows a larger decline in the rates of those 35-44 over time than for those 45-54, implying that men and women at the younger ages are perhaps responding to cardiovascular disease more effectively with preventative life style measures than are people at older ages. The results are significant in 1971 for ages 35-44 and 35-54 at the .05 (5%) level, and in 1981 for the same ages at the .01 (1%) level. The results in the age group 45-54, over time, as well as for all age groups in 1961, were not statistically significant. The explained variances ranged from 22 to 45 percent.

The ratio of malignant neoplasm mortality to general mortality, as shown in Table 5-5, supports the results of Chapter 4 and Hypothesis 4. Overall, the ratio has increased since 1951 (the reference category). There is a decline in the second year (1971), in the three age categories, but this decline is not statistically significant.

The ratio of chronic disease mortality to general mortality is, as mentioned in Chapter 4, a statistical compromise between the differing patterns of the cardiovascular disease mortality and the malignant neoplasm

TABLE 5-4

Regression of the Ratio of Cardiovascular Disease Death Rate to the General Death Rate, on Sex and Time, Conditioning for Selected Ages, Canada

	35-44				45-54				(35-54)			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	-.43	-10.268**	-.43	-6.13	-.66	-15.754**	-.66	-11.02	-.50	-13.044**	-.51	-10.55
Y1(61)	.11	-1.186	-.04	-.50	.05	-.173	-.01	-.09	.07	-.745	-.03	-.43
Y2(71)	-.11	-5.676*	-.21	-2.39	-.01	-1.527	-.06	-.76	-.06	-3.667*	-.12	-2.09
Y3(81)	-.16	-6.795**	-.25	-2.86	-.10	-3.271	-.12	-1.62	-.12	-5.098**	-.17	-2.91
a	--	25.048**	--	13.20	--	35.365**	--	22.12	--	30.288**	--	21.77
$\overline{X}$			16.45				26.25				21.36	
S.D.			11.98				12.00				12.94	
R^2			.24				.45				.28	
R^2adj.			.22				.43				.27	
N			159				160				319	

*p≤.05
**p≤.01

For a definition of statistics used, see Table 5-1.

TABLE 5-5

Regression of the Ratio of Malignant Neoplasm Death Rate to the General Death Rate, on Sex and Time, Conditioning for Selected Ages, Canada

	35-44				45-54				(35-54)			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	.62	17.788**	.62	9.73	.72	20.431**	.72	13.35	.65	19.202**	.64	15.09
Y1(61)	-.00	2.097	.06	.80	.05	5.268*	.16	2.43	.03	3.769*	.11	2.08
Y2(71)	-.03	.997	.03	.39	-.02	3.566	.11	1.64	-.02	2.232	.07	1.24
Y3(81)	.11	4.450	.14	1.72	.14	7.415**	.23	3.42	.12	5.883**	.17	3.26
a	--	9.391**	--	4.84	--	14.584**	--	8.50	--	12.240**	--	8.59
$\overline{X}$			20.46				28.82				24.68	
S.D.			14.48				14.27				14.95	
R^2			.40				.56				.44	
R^2adj.			.38				.54				.43	
N			156				159				315	

*p≤.05
**p≤.01

For a definition of statistics used, see Table 5-1.

TABLE 5-6

Regression of the Ratio of Chronic(1) Death Rate to the General Death Rate, on Sex and Time, Conditioning for Selected Ages, Canada

	35-44				45-54				(35-54)			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	.13	3.619*	.14	2.41	.09	2.290	.09	1.55	.11	2.979**	.11	2.68
Y1(61)	.05	.513	.02	.24	.05	2.646	.09	1.26	.05	1.588	.05	1.01
Y2(71)	-.06	-2.073	-.07	-.97	-.02	1.117	.04	.53	-.04	-.523	-.02	-.33
Y3(81)	-.01	-.906	-.03	-.43	.03	2.170	.07	1.04	.01	.587	.02	.37
a	--	17.273**	--	10.22	--	24.901**	--	15.03	--	21.119**	--	16.92
$\overline{X}$			18.44				27.53				23.01	
S.D.			13.41				13.22				14.06	
R^2			.02				.01				.01	
R^2adj.			.01				.00				.01	
N			315				319				634	

*p≤.05
**p≤.01

(1)Cardiovascular disease mortality and malignant neoplasm mortality together.

For a definition of statistics used, see Table 5-1.

mortality ratios, thus it does not explain very much (i.e.,1%) of the variance. The figures are not statistically significant in any of the years, thus it has little meanful information to offer.

When region, as a predictor variable, was entered into the regression equation at each age group and for each chronic disease category, (see Tables A-1 through A-3 in Appendix A) the amount of explained variance increased by 1% to 5% (the 5% increase occured for ages 45-54 for malignant neoplasm mortality, and primarily in the Quebec region).[33] This illustrates that region is not a highly significant factor in explaining the amount of change in chronic disease mortality over time.

Again, the results of Chapter 4 for this hypothesis are substantiated: the hypothesis of negative life style as increasing chronic disease mortality in general, is rejected, due to the decline in cardiovascular disease mortality. The ratio of malignant neoplasm mortality to general mortality, as in Chapter 4, DOES show support for the hypothesis that negative life style increases mortality.

Hy5. To test the assumption that males die at a higher rate than females in Canada, the general death rate is regressed on sex and conditioned for age and time.

Like in Hypothesis 3, a non-linear relationship was detected, thus the logarithm of the dependent variable (the general death rate), was modelled. A weight factor was also needed, due to the presence of heteroscedasticity in the age groupings. Without this weight, the equation for the 70+ group was not statistically significant.

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[33] Not shown.

Table 5-7 illustrates that effects of sex account for an increasing amount of the explained variance over age. By ages 70+, however, the effects of sex drop dramatically and explain only a small amount of the variance (less than 1% in 1951 to 31% in 1981). Yet, gender explains more (R^2) of the mortality variance in the 70+ age category than it does for the 35-44 age group in 1981, which is a reverse from 1951 (i.e., in 1951, gender explains 19% of the mortality variance in the 35-44 year olds and only 1% in those 70+; in 1981, these percentages are 23 and 31 respectively).

The statistics are significant at the .01 level. Similarly, the b coefficient is negative in each age group, reflecting females' lower mortality.[34] Hypothesis 5 is thus supported as women are shown to have a lower death rate than males, for each age group and year.

Hy6. This hypothesis tests the direction of the mortality rate over time by sex. Table 5-8 shows the logarithm of the death rate regressed on time, and controlling for age, while conditioning for sex. Due to collinearity in the age groups, the highly-correlated oldest age groups were collapsed together as the reference

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[34] Sex, or gender, is a dummy variable with males as the reference group.

TABLE 5-7

Regression of the Logarithm of the General Death Rate on Sex, Conditioning for Age, 1951-1981, Canada(1)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
1951												
S1(F)	-.44	-.376**	-.44	-15.95	-.67	-.501**	-.67	-34.31	-.71	-.489**	-.71	-43.81
a	--	1.365**	--	84.86	--	2.229**	--	227.48	--	3.082**	--	409.04
$\ln(\overline{X})$			1.19				2.00				2.86	
ln(SD)			.43				.37				.34	
R^2			.19				.45				.50	
R^2adj.			.19				.45				.50	
N			1,080				1,439				1,898	
1961												
S1(F)	-.56	-.584**	-.56	-22.22	-.72	-.628**	-.72	-40.09	-.84	-.663**	-.84	-68.43
a	--	1.239**	--	70.97	--	2.151**	--	206.65	--	3.011**	--	465.30
$\ln(\overline{X})$			.98				1.87				2.72	
ln(SD)			.52				.44				.39	
R^2			.32				.51				.71	

TABLE 5-7
(continued)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
R^2adj			.32				.51				.71	
N			1,066				1,539				1,958	
1971												
S1(F)	-.52	-.567**	-.52	-20.69	-.72	-.755**	-.72	-43.00	-.82	-.767**	-.82	-67.93
a	--	1.322**	--	73.06	--	2.214**	--	191.38	--	3.023**	--	399.44
ln($\overline{X}$)			1.07				1.89				2.68	
ln(SD)			.54				.52				.47	
R^2			.27				.52				.68	
R^2adj			.27				.52				.67	
N			1,154				1,695				2,229	
1981												
S1(F)	-.49	-.692**	-.49	-18.91	-.65	-.737**	-.65	-35.34	-.79	-.770**	-.79	-63.76
a	--	1.212**	--	50.39	--	2.090**	--	152.31	--	2.909**	--	357.85

TABLE 5-7
(continued)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
$\ln(\overline{X})$			.91				1.77				2.56	
ln(SD)			.71				.56				.48	
R'			.24				.42				.63	
R'adj			.23				.42				.63	
N			1,166				1,703				2,386	

TABLE 5-7
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
1951								
S1(F)	-.72	-.391**	-.72	-39.60	-.09	-.034**	-.09	-3.29
a	--	3.597**	--	531.96	--	4.305**	--	533.67
ln($\overline{X}$)			3.41				4.28	
ln(SD)			.27				.18	
R^2			.51				.01	
R^2adj.			.51				.01	
N			1,505				1,312	
1961								
S1(F)	-.83	-.536**	-.83	-58.81	-.34	-.164**	-.34	-14.95
a	--	3.605**	--	571.53	--	4.300**	--	488.18
ln($\overline{X}$)			3.35				4.20	
ln(SD)			.32				.23	
R^2			.69				.12	
R^2adj			.69				.12	

TABLE 5-7
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
N			1,559				1,706	
1971								
S1(F)	-.90	-.739**	-.90	-83.95	-.52	-.295**	-.52	-27.99
a	--	3.602**	--	594.36	--	4.324**	--	503.07
$\ln(\overline{X})$			3.25				4.13	
ln(SD)			.41				.27	
R'			.81				.27	
R'adj			.81				.27	
N			1,705				2,074	
1981								
S1(F)	-.88	-.782**	-.88	-81.45	-.55	-.344**	-.55	-33.82
a	--	3.518**	--	530.76	--	4.238**	--	512.34
$\ln(\overline{X})$			3.15				4.01	

TABLE 5-7
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
ln(SD)			.44				.29	
R'			.77				.31	
R'adj			.77				.31	
N			1,940				2,587	

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Table 5-1.

TABLE 5-8

Regression of the Logarithm of the General Death Rate on Age and Time, Conditioning for Sex, Canada[1]

	MALES				FEMALES			
	r	b	B	t	r	b	B	t
Y1(1961)	-.01	-.043**	-.02	-4.69	.01	-.173**	-.06	-16.19
Y2(1971)	.01	-.009	-.00	-1.00	-.01	-.243**	-.09	-23.48
Y3(1981)	-.01	-.105**	-.05	-12.00	-.03	-.368**	-.14	-36.30
A1(35-44)[2]	-.66	-2.605**	-.91	-273.29	-.60	-2.915**	-.81	-253.07
A2(45-54)	-.37	-1.719**	-.70	-203.82	-.43	-2.130**	-.68	-211.69
A3(55-64)	.06	-.885**	-.39	-113.62	-.14	-1.314**	-.47	-145.97
a	--	3.928**	--	503.30	--	3.842**	--	440.75
$\ln(\overline{X})$			2.90				2.63	
ln(S.D.)			1.01				1.17	
R^2			.84				.85	
R^2adj.			.84				.85	
N			16,913				16,786	

$^*p \leq .05$
$^{**}p \leq .01$

[1] The equation is weighted. For weight formula, see Table 5-1.

[2] A1(35-44): A dummy variable for age; 0=65+, 1=35-44. A2(44-54): 0=65+, 1=44-54. A3(55-64): 0=65+, 1=55-64. For a definition of other statistics used, see Table 5-1.

category. This procedure largely eliminated the collinearity problem.

For males, the death rate has shown an overall decline since 1951. The results, although significant at the .01 level for 1961 and 1981, are not significant for 1971. For the females, conversely, the death rate shows a steady, significant decline in mortality since 1951. This supports the findings in Chapter 4, and as well, Hypothesis 6 which claims that the death rate for both males and females are declining over time. Goldscheider (1971) would argue that this decrease is due to modernization and the increased health and living standards which accompany economic development.

The intercept in Table 5-8 illustrates that females (a=3.842) have a lower death rate than males (a=3.928) even when controlling for age and time, further supporting the earlier Hypothesis 5.

When region as a predictor variable is entered into the equation (see Table A-4 in Appendix A), it accounts for less than 1 additional percent of explained variance. When time was used as a control variable in the equation, the Prairies region had significantly lower mortality over time than the other regions[35] for both males and females. From lowest to highest mortality (next to the Prairies region) for males, was the Atlantic region, British Columbia, Ontario then Quebec. For females, it was British Columbia, Ontario, Atlantic then Quebec.

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[35] The Prairies were the reference category for the dummy variable, region. Its value was assumed to be zero. If the b value in the equation of region 1 to 4 was positive (i.e., above zero), that region's mortality was assumed to be higher than the Prairies'. Conversely, if the b value was negative (below zero), then that region's mortality was assumed to be lower than the Prairies'.

When time was used as a conditioning variable, rather than as a control variable, the Prairies region, for males, continued lowest in mortality until 1981, at which point the mortality in both British Columbia and Ontario (although Ontario was not significant statistically) were lower than in the Prairies (see Table A-5 in Appendix A). The mortality in Quebec was almost consistently the highest of the regions over time, while the British Columbia region showed a change of status from second highest in mortality in 1951, to lowest regional mortality by 1981. In addition, region, when added to the regression equation as a predictor variable, explained only .5% additional variance in 1951 and .1% by 1981. In Chapter 4, a significant increase in the Atlantic, Prairies and British Columbia regions was detected for males between 1961 and 1971. This is not apparent in Table A-5, where all the regions show significant mortality decline over time (except for 1981), with the decline occuring after 1961.

Similarly, when time was used as a conditioning variable for females, the Prairies had statistically significantly the lowest mortality of the regions over time (Table A-6). Quebec usually had the highest regional mortality for females until 1981, whereby the death rate dropped lower than the Prairies region (although this is not at a significant level). The other regions remained reasonably constant in their mortality status relative to the Prairies. Also, as for males, region as a predictor variable explained only an additional .6% in 1951 and by 1981, an additional .1%.

In Chapter 4, an increase in mortality for British Columbian females was observed between 1961 and 1971. This increase is supported by the regression analysis results in Table A-6, since the decline in 1981 is not significant. The overall decline in mortality for all the regions for females is not as dramatic as for males and seems to occur mostly after 1971 (10 years later than for males) and slowing by 1981 (except for Quebec and British Columbia). Returning to Table 5-7, a similar decrease in mortality over time for females can be discerned over time by comparing the b coefficient of each age category by year. The decline in most of the age groups is substantial until 1971, after which time the decline slows considerably. This trend is discussed further in Hypothesis 7.

Hy7. Differences in mortality between the sexes was hypothesized to be caused by life style factors (Retherford, 1975; Waldron, 1976). A ratio indicating the rate of mortality change between men and women is thought to infer the extent to which life style affects mortality for each gender. In Chapter 4, the pattern of change in this ratio supported Hypothesis 7. The changing role of women in society is presumed to deleteriously affect their mortality risk in most cases, since 1971. This same measure was subjected to multiple regression and the results are shown in Table 5-9, and in Tables A-7 through A-12 in Appendix A. These same regression results are summarized in Figure 5-1.

The results of the regressions can be compared against results in Chapter 4 (Figure 4-5). There appear to be great similarities between the results in the two Figures. In fact, the 'u-shape' trend found in Chapter 4 seems to be prevalent in the results in Figure 5-1, indicating the 'turn-around' of mortality (actually the slowed decline in mortality) for women since 1971.

Unfortunately, many of the results in Figure 5-1 are not significant at the .01 or .05 level. The results for Canada are similar in both Figures 5-1 and 4-5, but the greatest variation in the two is for the Prairies region where the trends for all the ages are different between the two Figures except for ages 55-64. The results for the Prairies region in Figure 5-1 and Table A-11 are not statistically significant, except at the oldest ages, implying that the results for the Prairies may not be statistically valid. In any case, the overall pattern seems to support the hypothesis. In Figure 5-1, the results are statistically valid but differ from Figure 4-5 in the Atlantic region for ages 55-64 and 65-69, and in Quebec for ages 70+. In these cases (except for the Atlantic, ages

TABLE 5-9

Regression of the Ratio of Female to Male General Death Rate''' on Time, Controlling for Marital Status and Conditioning on Age, Canada

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.14	-12.146**	-.30	-2.53	.09	-3.914	-.13	-1.29	.07	-6.498*	-.23	-2.04
Y2(71)	.05	-6.743	-.16	-1.39	-.20	-10.708**	-.35	-3.53	-.22	-12.425**	-.44	-3.91
Y3(81)	-.17	-12.810**	-.32	-2.71	-.16	-9.643**	-.31	-3.18	-.22	-12.530**	-.45	-3.94
M1(S)	-.09	-16.114**	-.40	-3.41	-.10	-16.244**	-.53	-5.35	-.01	-8.188**	-.29	-2.58
M2(W)	.01	-13.370**	-.32	-2.75	-.07	-15.484**	-.50	-5.10	-.02	-8.268**	-.29	-2.60
M3(D)	-.37	-24.585**	-.60	-5.13	-.43	-23.651**	-.77	-7.79	-.35	-15.266**	-.54	-4.80
a	--	75.287**	--	16.96	--	67.548**	--	23.80	--	62.992**	--	21.18
$\bar{X}$			54.01				47.64				47.20	
S.D.			17.74				13.39				12.24	
R^2			.35				.53				.38	
R^2adj.			.29				.49				.33	
N			77				80				80	

TABLE 5-9
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.22	-1.210	-.04	-.34	.11	-10.978**	-.35	-3.64
Y2(71)	-.19	-11.268**	-.34	-3.18	-.30	-19.369**	-.63	-6.62
Y3(81)	-.30	-14.096**	-.42	-3.98	-.37	-21.014**	-.69	-7.18
M1(S)	-.05	-12.518**	-.38	-3.58	.23	3.598	.12	1.23
M2(W)	.01	-11.206**	-.34	-3.21	.06	-.337	-.01	-.12
M3(D)	-.42	-21.815**	-.64	-6.16	-.38	-10.838**	-.34	-3.60
a	--	66.655**	--	20.21	--	77.545**	--	28.26
$\overline{X}$			48.68				62.99	
S.D.			14.58				13.42	
R^2			.47				.56	
R^2adj.			.43				.52	
N			79				78	

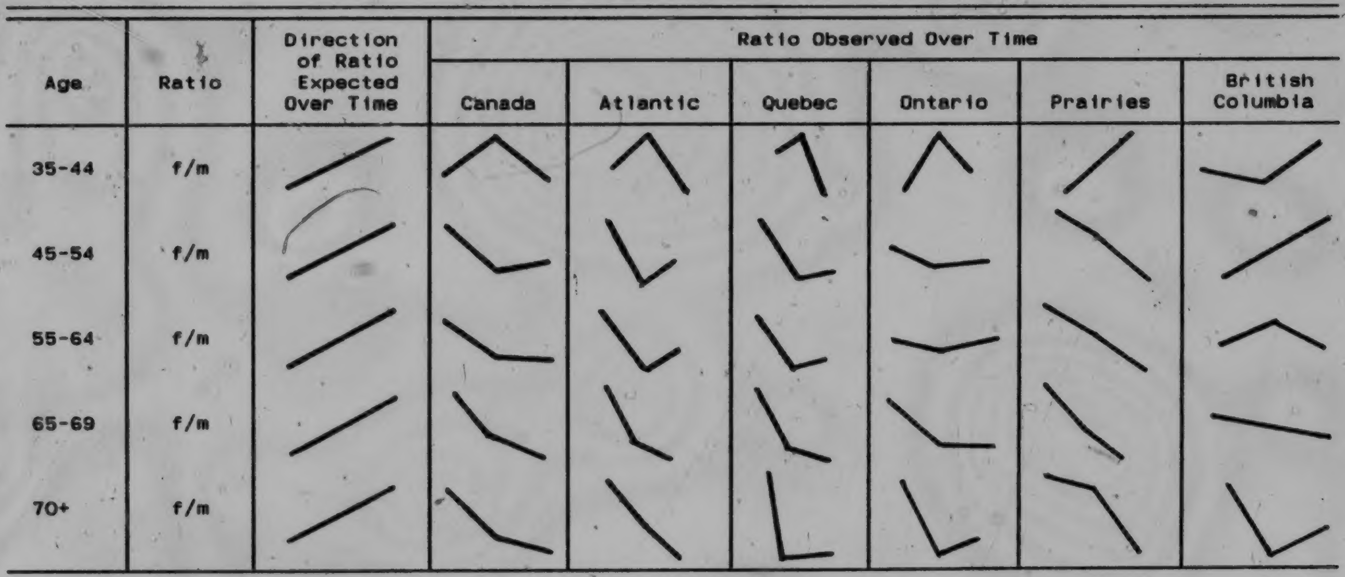
*p≤.05
**p≤.01

(1)Ratio: Female general death rates, by age group and year/male general death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

FIGURE 5-1

Graphing the Slopes of the Female to Male General Mortality Ratio (f/m)[1], for Various Ages, Canada and Regions, 1961-1981[2]



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[1] f/m = the slope of the female general death rate, for age group and year/the slope of the male general death rate for age group and year X 100.
[2] The reference category used is 1951.

0: p≤.05.

SOURCE: Table 5-9, and Tables A-7 through A-12.

65-69) the significant results add further support for the life style hypotheses by indicating an upward trend in the ratio by 1981.

Similar to results in Chapter 4, results for Chapter 5 illustrate that the life style changes generally affect mortality prior to age 65. Also, this upward mortality trend in the mortality ratio (for women), does not yet occur for the earliest ages 35-44 for the Atlantic and Quebec regions, again providing support for the 'culture lag' hypothesis discussed in Chapter 4. Similarly, the Atlantic and Quebec regions add 7% of explained variance (in relation to the Prairies region) to the regression equation for ages 70+; the Atlantic region alone adds 7% of the explained variance for ages 55-64.[34] These two regions were also singled out in Chapter 4 as providing variance from the patterns found in the other regions over time.

Overall, the Canadian data continue to support the findings in Chapter 4, in that life style has begun (mostly since about 1971) to affect females more deleteriously than males.

Hy8. Due to the 'masculine sex role' discussed earlier in the thesis, it is suggested that men's mortality will be higher than females, at all ages and regardless of cause. It was shown to be true for general mortality, and it is also generally true for chronic diseases (as shown in Chapter 4).

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[34] Not shown.

Many exceptions, however, prove the assumptions of this hypothesis to be false.

As in Chapter 4, Table 5-10 shows that cardiovascular disease mortality is higher for men, regardless of age or year. The logarithm of women's rates in these Tables are consistently significantly lower than men's. Table 5-11 (malignant neoplasm mortality) supports the findings in Chapter 4 and rejects Hypothesis 8. Mortality for women is higher than for men at the earlier ages of 35-44, and in many cases, 45-54 ($p<.01$ level), due to a higher incidence of cancer in women (perhaps from breast cancer) at this age than for men. Conversely, cancer for men is higher at ages 55 and above (perhaps from lung cancer).

When region was added to the equation (Tables A-13 and A-14, in Appendix A) as a predictor variable, it accounted for less than 1% increase in the explained variance of the equation for either males or females, and for either cardiovascular disease or malignant neoplasms.[37] Region showed some variation when time was controlled in the regression equation. Next to the Prairies, British Columbia had the lowest mortality, which in most cases was followed by the Atlantic region. Quebec usually had the highest mortality for the regions, over time, except for cardiovascular disease for males, when Ontario had the highest mortality.

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[37] Not shown. This information was obtained through running a stepwise procedure when entering the equations in the SPSSx computer program.

TABLE 5-10

Regression of the Logarithm of the Cardiovascular Death Rate on Sex, Conditioning for Age, 1951-1981, Canada(1)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
1951												
S1(F)	-.57	-.710**	-.57	-15.47	-.83	-1.014**	-.83	-42.49	-.79	-.766**	-.79	-46.17
a	--	-.003	--	-.09	--	1.239**	--	83.95	--	2.246**	--	210.32
$\ln(\overline{X})$			-.30				.85				1.93	
ln(SD)			.62				.59				.48	
R²			.32				.69				.63	
R²adj.			.32				.69				.63	
N			502				804				1,249	
1961												
S1(F)	-.73	-1.347**	-.73	-23.54	-.89	-1.289**	-.89	-59.17	-.88	-.997**	-.88	-66.61
a	--	.000	--	.00	--	1.264**	--	97.02	--	2.219**	--	236.08
$\ln(\overline{X})$			-.46				.80				1.83	
ln(SD)			.87				.69				.55	
R²			.53				.80				.78	

TABLE 5-10
(continued)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
R'adj			.53				.80				.78	
N			485				881				1,289	
1971												
S1(F)	-.79	-1.447**	-.79	-26.95	-.89	-1.534**	-.89	-58.28	-.89	-1.258**	-.89	-72.09
a	--	-.196**	--	-6.44	--	1.221**	--	80.28	--	2.169**	--	201.79
ln($\overline{X}$)			-.66				.71				1.69	
ln(SD)			.86				.82				.69	
R'			.62				.79				.79	
R'adj			.62				.79				.79	
N			454				910				1,388	
1981												
S1(F)	-.76	-1.522**	-.76	-24.55	-.84	-1.473**	-.84	-46.40	-.91	-1.211**	-.91	-81.36
a	--	-.387**	--	-10.86	--	1.000**	--	54.14	--	1.917**	--	206.31

TABLE 5-10
(continued)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
$\ln(\overline{X})$			-.89				.50				1.45	
ln(SD)			.95				.83				.65	
R^2			.57				.71				.83	
R^2adj			.57				.71				.83	
N			452				878				1,400	

TABLE 5-10
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
1951								
S1(F)	-.74	-.539**	-.74	-36.79	-.43	-.227**	-.43	-21.18
a	--	2.772**	--	287.01	--	3.627**	--	485.52
$\ln(\overline{X})$			2.54				3.52	
ln(SD)			.36				.26	
R'			.55				.19	
R'adj.			.55				.19	
N			1,092				1,938	
1961								
S1(F)	-.81	-.655**	-.81	-47.34	-.56	-.339**	-.56	-31.94
a	--	2.825**	--	307.14	--	3.674**	--	495.90
$\ln(\overline{X})$			2.54				3.51	
ln(SD)			.40				.31	
R'			.66				.31	
R'adj			.66				.31	

TABLE 5-10
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
N			1,144				2,270	
1971								
Si(F)	-.86	-.936**	-.86	-57.87	-.62	-.438**	-.62	-39.06
a	--	2.761**	--	261.56	--	3.631**	--	456.07
$\ln(\overline{X})$			2.36				3.41	
ln(SD)			.54				.35	
R^2			.74				.38	
R^2adj			.74				.38	
N			1,194				2,478	
1981								
Si(F)	-.90	-1.022**	-.90	-74.04	-.62	-.445**	-.62	-41.17
a	--	2.600**	--	288.64	--	3.468**	--	447.64
$\ln(\overline{X})$			2.17				3.24	

TABLE 5-10
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
ln(SD)			.56				.36	
R^2			.81				.38	
R^2adj			.81				.38	
N			1,285				2,752	

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Table 5-1.

TABLE 5-11

Regression of the Logarithm of the Malignant Neoplasm Death Rate on Sex, Conditioning for Age, 1951-1981, Canada'''

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
1951												
S1(F)	.56	.621**	.56	14.46	.37	.259**	.37	10.74	-.13	-.073**	-.13	-4.03
a	--	-.877**	--	-26.64	--	.418**	--	23.62	--	1.420**	--	112.00
ln($\overline{X}$)			-.51				.56				1.38	
ln(SD)			.55				.35				.28	
R^2			.32				.14				.02	
R^2adj.			.31				.14				.02	
N			457				716				983	
1961												
S1(F)	.43	.428**	.43	10.43	.24	.163**	.24	7.17	-.52	-.230**	-.52	-19.96
a	--	-.801**	--	-25.88	--	.437**	--	26.23	--	1.466**	--	182.97
ln($\overline{X}$)			-.56				.52				1.36	
ln(SD)			.50				.33				.22	
R^2			.18				.06				.27	

TABLE 5-11
(continued)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
R'adj			.18				.06				.27	
N			493				812				1,071	
1971												
S1(F)	.20	.193**	.20	4.75	.09	.053**	.09	2.68	-.58	-.291**	-.58	-25.51
a	--	-.628**	--	-21.19	--	.522**	--	36.61	--	1.576**	--	197.04
ln($\overline{X}$)			-.53				.55				1.43	
ln(SD)			.47				.30				.25	
R'			.04				.01				.34	
R'adj			.04				.01				.34	
N			524				910				1,294	
1981												
S1(F)	.15	.144**	.16	3.65	-.12	-.072**	-.12	-3.84	-.63	-.385**	-.63	-31.47
a	--	-.706**	--	-24.60	--	.617**	--	45.99	--	1.689**	--	197.79

TABLE 5-11
(continued)

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
$\ln(\overline{X})$			-.63				.58				1.50	
ln(SD)			.47				.30				.31	
R'			.02				.02				.40	
R'adj			.02				.01				.40	
N			562				986				1,500	

TABLE 5-11
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
1951								
S1(F)	-.43	-.255**	-.43	-13.43	-.51	-.241**	-.51	-20.86
a	--	1.962**	--	152.04	--	2.482**	--	314.14
$\ln(\overline{X})$			1.84				2.37	
ln(SD)			.30				.24	
R^2			.18				.26	
R^2adj.			.18				.25	
N			800				1,276	
1961								
S1(F)	-.69	-.485**	-.70	-28.34	-.73	-.462**	-.73	-42.75
a	--	2.110**	--	182.14	--	2.676**	--	366.95
$\ln(\overline{X})$			1.89				2.47	
ln(SD)			.35				.31	
R^2			.48				.54	
R^2adj			.48				.54	

TABLE 5-11
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
N			864				1,565	
1971								
S1(F)	-.75	-.578**	-.75	-36.42	-.80	-.581**	-.80	-56.84
a	--	2.242**	--	208.00	--	2.797**	--	398.85
$\ln(\overline{X})$			1.98				2.52	
ln(SD)			.38				.36	
R^2			.57				.64	
R^2adj			.57				.64	
N			1,021				1,799	
1981								
S1(F)	-.83	-.528**	-.83	-51.29	-.90	-.668**	-.90	-94.42
a	--	2.230**	--	312.52	--	2.891**	--	590.18
$\ln(\overline{X})$			1.98				2.57	

TABLE 5-11
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
ln(SD)			.32				.37	
R'			.69				.81	
R'adj			.69				.81	
N			1,212				2,136	

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Table 5-1.

When time was used as a conditioning variable, mortality showed some variation. In cardiovascular disease for males and females (Tables A-15 and A-16), the Atlantic region, relative to the Prairies region, moved from the status of lowest mortality in 1951 to the highest in 1981. All the regions, except the Atlantic, showed a significant decline in mortality after 1971 (the males' slope is steeper than the females, suggesting a life style rather than biological difference in mortality) although the only region in which this decline was not statistically significant was Quebec.

For malignant neoplasm mortality for males (Table A-17), the Atlantic, Ontario, and British Columbia regions (relative to the Prairies region) showed an increase in mortality until 1961, a slight decrease or levelling of mortality between 1961 and 1971, and then a continued increase to 1981. Quebec, however, shows an increase until 1971 and then a decline thereafter. These trends are all significant at the .05 level at least (except for British Columbia in 1971 and 1981). This overall increasing cancer mortality trend might be attributable to the high incidence of smoking among men.

For females (Table A-18), all the regions show a decline after 1961, except for Quebec, which shows a decline after 1971. This decline, however, is only statistically significant for Ontario through 1981. With lung cancer on the increase for women, it is anticipated that this downward trend in mortality is only a temporary one.

The assumptions of Hypothesis 8 that male mortality is always higher than females', regardless of cause or age, is proven false for malignant neoplasm mortality, through the analysis of rates (Chapter 4) and through multiple regression analysis.

Hy9. The ratio of female to male mortality discussed in Hypothesis 7 with regard to general mortality is now applied to chronic diseases in an effort to determine whether there is an indication that life style factors also influence female mortality more detrimentally than male mortality in cardiovascular disease mortality and in malignant neoplasm mortality. The results are shown in Table 5-12 (and A-19 through A-24 in Appendix A), and 5-13 (and A-25 through A-30, also in Appendix A). These results are summarized in Figures 5-2 and 5-3.

Detrimental life styles seem to have recently (between 1971 and 1981) negatively affected female cardiovascular disease as well as general mortality. A comparison of Figures 4-7 and 5-2 illustrate similar trends, especially in the case of Canada overall. Only three of the statistically significant cases in Figure 5-2 differ from those illustrated in Figure 4-7 (i.e., Atlantic, ages 65-69 and 70+, and Ontario, 65-69). Two of these trends in Figure 5-2 show an upward trend in mortality for women since 1971, undetected through the use of rates in Chapter 4. As well,

TABLE 5-12

Regression of the Ratio of Female to Male Cardiovascular Disease Death Rate(1) on Time, Controlling for Marital Status and Conditioning on Age, Canada

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.01	-12.633*	-.29	-2.12	.07	-5.876	-.20	-1.57	.06	-8.355*	-.26	-2.10
Y2(71)	-.17	-18.547**	-.41	-3.07	-.21	-11.663**	-.42	-3.19	-.28	-16.645**	-.51	-4.18
Y3(81)	-.18	-18.809**	-.42	-3.11	-.19	-11.061**	-.39	-3.03	-.18	-14.253**	-.44	-3.58
M1(S)	.15	-2.091	-.05	-.38	-.21	-7.040	-.25	-1.95	-.01	-2.608	-.08	-.66
M2(W)	-.09	-12.910	-.24	-1.92	.18	1.036	.04	.29	.16	1.503	.05	.38
M3(D)	-.33	-16.946**	-.39	-3.05	-.10	-4.416	-.15	-1.17	-.24	-8.173*	-.25	-2.05
a	--	46.063**	--	8.57	--	35.970**	--	10.57	--	45.206**	--	12.15
$\bar{X}$			26.16				26.16				33.07	
S.D.			19.60				12.40				14.20	
R^2			.29				.22				.28	
R^2adj.			.22				.16				.22	
N			68				77				80	

TABLE 5-12
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.13	-6.641	-.17	-1.70	.05	-5.586	-.17	-1.38
Y2(71)	-.22	-17.877**	-.45	-4.53	-.15	-8.961*	-.28	-2.27
Y3(81)	-.28	-18.372**	-.47	-4.71	-.14	-8.842*	-.28	-2.24
M1(S)	-.06	-13.019**	-.33	-3.39	.18	2.191	.07	.56
M2(W)	.17	-6.382	-.16	-1.66	.18	2.161	.07	.55
M3(D)	-.50	-26.588**	-.66	-6.72	-.47	-13.806**	-.41	-3.38
a	--	61.705**	--	16.99	--	68.483**	--	18.56
$\overline{X}$			39.83				60.64	
S.D.			17.12				14.04	
R'			.54				.29	
R'adj.			.50				.23	
N			78				77	

*p≤.05
**p≤.01

'''Ratio: Female cardiovascular disease death rates, by age group and year/male cardiovascular disease death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE 5-13

Regression of the Ratio of Female to Male Malignant Neoplasm Death Rate''' on Time, Controlling for Marital Status and Conditioning on Age, Canada

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.16	2.076	.04	.14	-.18	11.532	.22	1.26	.12	-.682	-.02	-.12
Y2(71)	.03	-.680	-.01	-.05	.43	25.882**	.56	2.86	.06	-2.581	-.07	-.45
Y3(81)	.19	11.524	.26	.83	.08	16.665	.38	2.00	-.27	-12.049*	-.31	-2.09
M1(S)	.41	-20.562	-.45	-.90	.17	-8.010	-.15	-.80	.03	-4.139	-.10	-.75
M2(W)	-.28	-45.453	-.86	-1.89	.11	-5.822	-.13	-.58	.11	-3.610	-.09	-.69
M3(D)	-.27	-40.767	-.93	-1.76	-.51	-23.684*	-.55	-2.42	-.38	-18.341**	-.45	-3.39
a	--	91.157**	--	3.59	--	68.438**	--	6.21	--	81.297**	--	15.31
$\bar{X}$			62.40				71.54				71.06	
S.D.			22.04				21.18				17.42	
R'			.35				.47				.24	
R'adj.			.12				.35				.16	
N			24				36				68	

TABLE 5-13
(continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	-.14	-15.423**	-.31	-2.53	.02	-8.119	-.19	-1.45
Y2(71)	-.11	-15.499**	-.32	-2.55	-.06	-9.514	-.23	-1.71
Y3(81)	-.04	-11.659	-.24	-1.94	-.19	-12.445*	-.30	-2.26
M1(S)	.21	.994	.02	.17	.28	5.359	.13	1.03
M2(W)	.05	-5.658	-.12	-.97	.01	-4.219	-.10	-.83
M3(D)	-.50	-26.065**	-.51	-4.33	-.49	-21.645**	-.46	-3.86
a	--	76.070**	--	13.68	--	68.006**	--	13.58
$\overline{X}$			58.04				55.97	
S.D.			21.52				18.65	
R'			.34				.33	
R'adj.			.28				.26	
N			75				72	

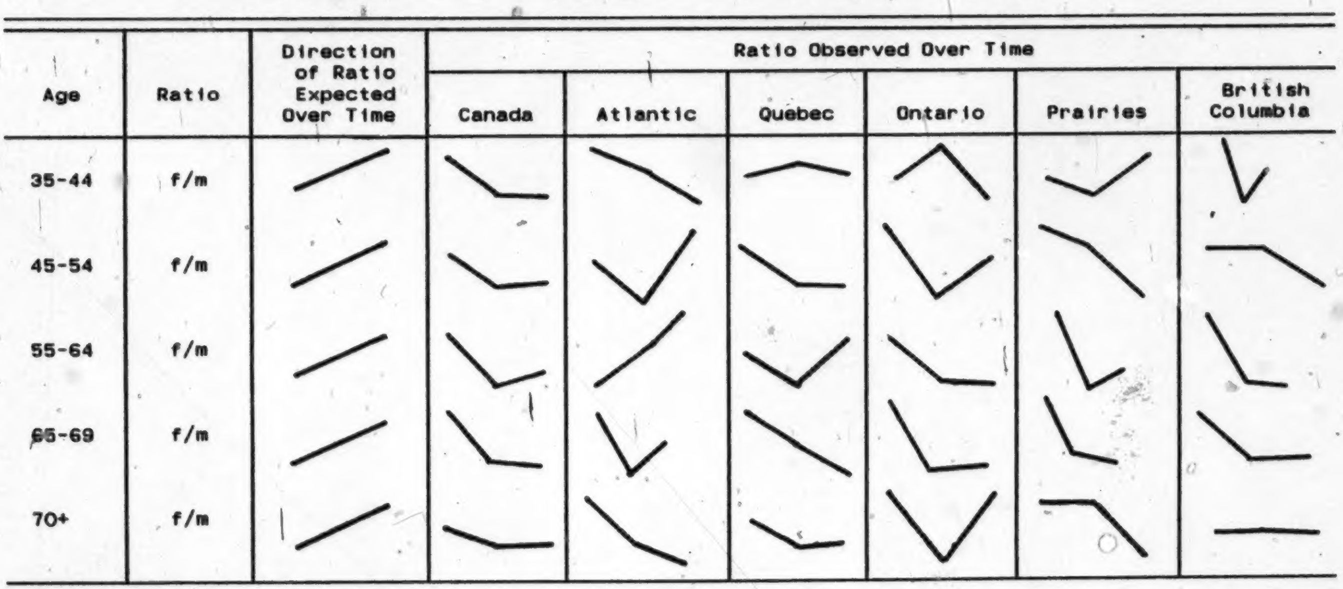
*p≤.05
**p≤.01

'''Ratio: Female malignant neoplasm death rates, by age group and year/male malignant neoplasm death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

FIGURE 5-2

Graphing of the Slopes of the Female to Male Cardiovascular Disease Mortality Ratio (f/m)(1), for Various Ages, Canada and Regions, 1961-1981(2)



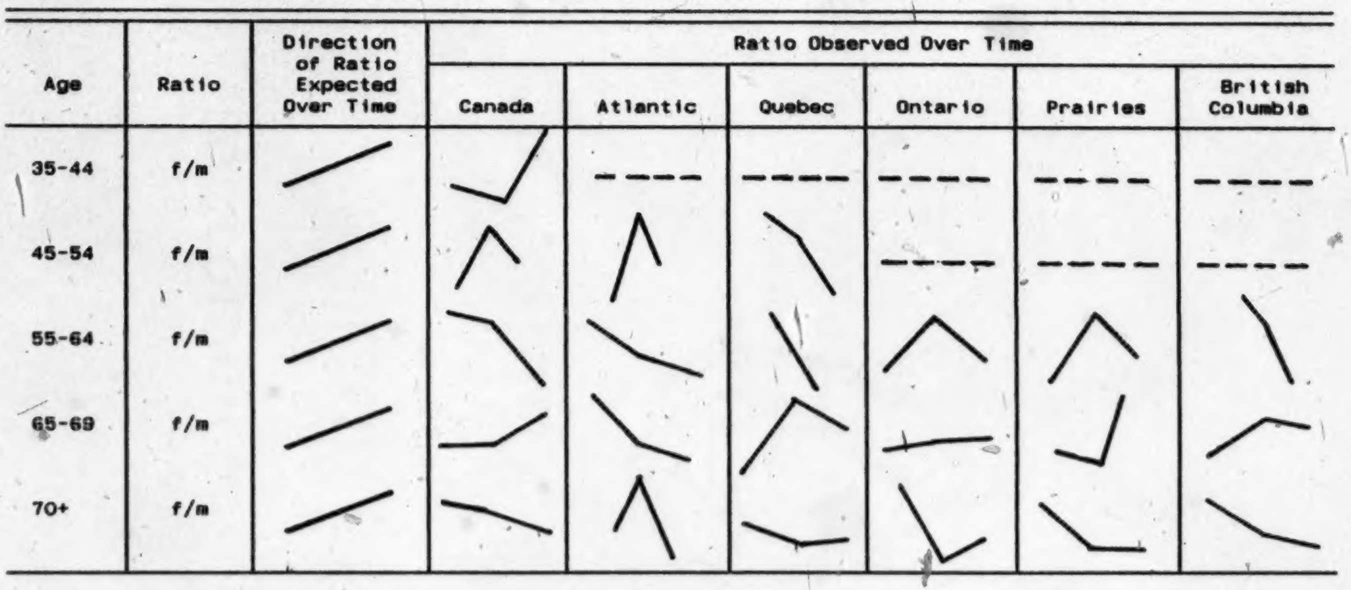
(1) f/m = the slope of the female cardiovascular disease death rate, for age group and year/ the slope of the male cardiovascular disease death rate for age group and year X 100.
(2) Reference category is 1951.

O: p≤.05.

SOURCE: Table 5-12, and Tables A-19 to A-24.

FIGURE 5-3

Female to Male Malignant Neoplams Mortality Ratio (f/m), for Various Ages, Canada and Regions, 1961-1981[1][2]



[1] f/m = the slope of the female malignant neoplasm death rate, for age group and year/the slope of the male malignant neoplasm death rate for age group and year X 100.
[2] Reference category is 1951.

0: $p \leq .05$.

SOURCE: Table 5-13, and Tables A-25 to A-30.

most of the statistically significant results graphed in Figure 5-2 continue to show support for the life style hypothesis as beginning to deleteriously affect female cardiovascular disease mortality.

When region is added as a predictor variable to the equation for cardiovascular disease mortality, most of the variation occurs at the two youngest ages, and at the oldest ages. In ages 35-44, 8% additional variance is determined (Table A-19) by adding region to the equation, of which 4% of the extra explained variance (R^2) is due to the addition of the British Columbia region (relative to the Prairies region, the reference group). Similarly, in ages 44-54, 4% of the additional 6% explained variance is also due to British Columbia. At the oldest ages, however, the Atlantic region accounts for 3%, and Quebec, 4%, of the additional 7% explained variance.[38] This seems to imply an east-west variation in mortality depending upon age: most of the variation in cardiovascular mortality at the early ages seems to be due to British Columbia, while the variation in the oldest ages is more affected by the Atlantic and Quebec regions. Unfortunately, few of the results for the regions are statistically significant, except for the Atlantic region for ages 70+.

Results of regression analysis of malignant neoplasm mortality (Figure 5-3), unlike results in Chapter 4 (Figure

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[38] These statistics are not shown in tables, but were generated through the application of a stepwise procedure in SPSSx.

4-7), indicate a narrowing of death rates between the sexes (i.e., increased female death rates relative to males) for the earliest ages (35-44) and at the oldest ages (65-69 and 70+) for many regions of Canada. Ages 45-54 and 55-64 show a continued decline of the ratio between the sexes, indicating a widening of death rates, with males' rates increasing at a faster rate than females. The results for the earliest ages, for Canada, however, are not statistically significant (in fact, most of the results of the regions are also not significant) which means indirect support for the hypothesis that life style influences are beginning to deleteriously affect female mortality more than male mortality as was suggested in Chapter 4.

When region was entered into the regression equation, an additional 24% of variance at ages 35-44 was explained: 17% due to British Columbia, and 7% due to Ontario (relative to the Prairies region).[39] Unfortunately, due to a very small frequency of rates in this age category for all the regions, the computer was not able to define a statistical relationship in the equations at these age groups, so these (and in some cases the next age group, for the same reason), were omitted from the analysis. Upon checking Figure 4-7, it is readily observed that British Columbia and Ontario (relative to the Prairies) did provide the most pronounced increase in the ratio than did the other regions (or Canada as a whole), which accounts for the large amount of variance attributed to them by the equation.

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[39] These figures are not shown, but are available.

Due to a lack of significant statistical information to the contrary, the life style hypothesis, as discussed in Chapter 4, is also supported for maligant neoplasm mortality. From the data, it is believed that malignant neoplasm death rates for females are beginning to increase while those for the males are beginning to decrease, in relative terms.

Hy10. To further test the assumption that death rates vary with marital status, and that the order of lowest to highest mortality is married, single, widowed and divorced, the logarithm of the death rate is regressed on marital status controlling for sex and age (the last two age categories are collapsed in order to reduce multi-collinearity), and conditioning on time. Table 5-14 shows the results.

As indicated in Chapter 4, those married indeed have the lowest rates across time.** This is significant at the .01 level. Over time, mortality is increasing for all the unmarried groups (except for those divorced who show some fluctuation between 1961 and 1971), and the order of highest and lowest in mortality by marital status changes. For instance, between 1951 and 1981, those widowed changed their status from lowest mortality to highest (relative to those married). Next highest is followed by those divorced and

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**Those married are the reference group for the dummy variable, marital status.

TABLE 5-14

Logarithm of the General Death Rate Regressed on Marital Status, Controlling for Sex and Age, 1951 to 1981, for Canada[1]

	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	.02	.338**	.13	32.05	.03	.351**	.13	33.60	.06	.450**	.17	43.12	.08	.587**	.21	55.83
M2(W)	.18	.297**	.12	26.94	.18	.351**	.13	32.16	.20	.500**	.18	45.65	.22	.638**	.23	60.07
M3(D)	-.01	.542**	.10	24.15	-.00	.628**	.12	31.74	-.00	.540**	.13	34.95	-.01	.619**	.18	48.82
S1(F)	-.09	-.346**	-.17	-40.75	-.11	-.500**	-.22	-59.52	-.14	-.625**	-.29	-75.11	-.14	-.671**	-.30	-83.05
A1	-.65	-2.665**	-.91	-207.18	-.63	-2.870**	-.88	-222.21	-.60	-2.722**	-.84	-211.27	-.59	-2.821**	-.81	-220.14
A2	-.39	-1.854**	-.71	-159.81	-.39	-1.982**	-.71	-175.35	-.39	-1.914**	-.69	-171.29	-.39	-1.950**	-.66	-176.35
A3	.03	-1.001**	-.42	-94.62	-.02	-1.145**	-.44	-110.19	-.05	-1.125**	-.45	-110.78	-.08	-1.152**	-.44	-117.79
a	--	3.855**	--	438.31	--	3.899**	--	458.15	--	3.848**	--	455.05	--	3.708**	--	460.70
$\ln(\overline{X})$		2.81				2.76				2.77				2.73		
ln(SD)		1.05				1.12				1.09				1.12		
R^2		.89				.90				.88				.88		
R^2adj.		.89				.90				.88				.88		
N		7,233				7,829				8,856				9,781		

*$p \leq .05$
**$p \leq .01$

[1] Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44; A2=ages 45-54, and A3=ages 55-64.

then those single.

These results support the preliminary findings in Chapter 4 in that those married had significantly lower death rates than those unmarried, and that the order of the unmarried statuses varied over time in relative rank order. In Chapter 4, a dramatic decrease since 1961 was discovered in the death rate of those divorced. In this analysis, this dramatic decline is apparent between 1961 and 1971 (the slope of the b coefficient declines from .628 to .540) which again illustrates the decline in death rates between 1961 and 1971 as was observed in Chapter 4. It was believed that there was an association between the declining divorce death rates and the 1968 divorce law changes made in Canada.

Region, as a predictor variable, explains less than 1% additional explained variance of the equation.*' (Due to the extremely small contribution to explained variance, region will subsequently be omitted from further analysis involving marital status.) When marital status, age, and sex are held as controls, and conditioned by time, mortality varies by region (see Table A-31). The lowest mortality is held by the Prairies region until 1981, at which point British Columbia illustrates lower mortality. Quebec shows the highest mortality until 1981, whereby it slips to third highest (although not statistically significant), replaced by the Atlantic region. The mortality in the all the regions are declining since 1961, even when age, sex, and marital status are controlled.

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*'Not shown.

The factors of age, sex and marital composition appear to explain a great amount of the variation in mortality in the equation (between 88% and 90%), although these R^2 statistics are somewhat inflated due to the weight used. That mortality is declining over time (since 1961) even when age, sex and marital status are controlled, is apparent from the a coefficient of the intercept in Table 5-14. It declines from 3.899 (in 1961) to 3.708 (in 1981).

As discussed in Chapter 4, Hypothesis 10 cannot be supported, in a strict sense, as mortality by marital status does not consistently show married, single, widowed, and divorced as having the lowest to highest rank order in death rates.

Hy11. Further to Hypothesis 10, it is suggested that due to a 'protection' element of marriage (Gove, 1973; Kobrin and Hendershot, 1977), those who are married should have a lower death rate than those not married, for any particular year. Returning to Table 5-14, it is shown that this is the case. The b coefficient of the unmarried groups are all significantly higher than the reference category (those married), indicating that the mortality of those married is indeed lower than the mortality of the other marital status groups: single, widowed and divorced.

Similar to findings in Chapter 4, the b coefficients of the mortality of those unmarried (relative to those married), are increasing over time, except for those divorced, whose mortality has been declining since 1961. This, like in Chapter 4, illustrates the changing mortality status of those divorced.

Hypothesis 11, the protection aspect of marriage as suggested by Gove and Kobrin and Hendershot, is supported for general mortality in Canada.

Hy12. Gove (1973) hypothesizes that the protection element of marriage benefits men more than women. Through the application of rates in Chapter 4, it was found that this was the case. This same information is now submitted to regression analysis to test the significance of these findings.

Tables 5-15 and 5-16 show the application of the natural logarithm of the general death rate applied to marital status, controlling for age, and conditioning for the variables of gender and time. A weight was applied to reduce heteroscedasticity in the data. These equations supplied information on the significance of the relationship between the mortality of the various unmarried and married states, by sex. The figures were highly significant and explained between 87 and 92% of the variance in the equations.

To test the hypothesis, a further step was needed. Tables 5-15 and 5-16 provided the first part of the required equation: protection of marriage. Thus:

TABLE 5-15

Logarithm of the General Death Rate Regressed on Marital Status, Controlling for Age and Conditioning by Year and Sex, Canada⁽¹⁾

	MALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	.03	.593**	.18	33.16	.03	.365**	.15	31.92	.07	.486**	.20	42.45	.10	.651**	.25	52.41
M2(W)	.12	.297**	.11	20.26	.07	.188**	.06	12.72	.10	.383**	.12	24.84	.11	.556**	.16	33.50
M3(D)	.04	.704**	.14	27.77	.05	.794**	.17	36.89	.05	.629**	.17	36.89	.05	.746**	.24	49.58
A1	-.69	-2.564**	-.97	-171.66	-.68	-2.738**	-.96	-190.72	-.66	-2.665**	-.95	-186.50	-.64	-2.770**	-.91	-181.97
A2	-.37	-1.695**	-.72	-126.10	-.38	-1.814**	-.74	-143.00	-.37	-1.764**	-.73	-140.84	-.38	-1.867**	-.71	-140.48
A3	.11	-.835**	-.39	-67.30	.08	-.945**	-.42	-79.91	.07	-.943**	-.43	-81.08	.02	-1.024**	-.43	-84.81
a	--	3.739**	--	418.35	--	3.796**	--	454.34	--	3.753**	--	452.19	--	3.628**	--	432.69
$\ln(\overline{X})$			2.91				2.88				2.92				2.88	
ln(SD)			.97				1.02				1.00				1.05	
R^2			.91				.92				.91				.90	
R^2adj.			.91				.92				.91				.90	
N			3,696				3,963				4,429				4,825	

*$p \leq .05$
**$p \leq .01$

⁽¹⁾Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54, A3=ages 55-64.

TABLE 5-16

Logarithm of the General Death Rate Regressed on Marital Status, Controlling for Age and Conditioning by Year and Sex, Canada[1]

	FEMALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	-.01	.249**	.09	14.45	.02	.308**	.10	18.21	.05	.387**	.13	22.38	.06	.488**	.16	29.03
M2(W)	.25	.250**	.10	15.94	.30	.386**	.15	25.51	.33	.504**	.20	32.90	.37	.613**	.24	42.92
M3(D)	-.05	.319**	.05	8.80	-.06	.402**	.07	12.50	-.05	.424**	.10	16.84	-.08	.457**	.12	22.73
A1	-.63	-2.760**	-.86	-136.25	-.62	-2.981**	-.81	-144.49	-.57	-2.748**	-.75	-130.06	-.59	-2.864**	-.74	-139.83
A2	-.42	-2.023**	-.70	-110.24	-.43	-2.132**	-.68	-119.46	-.45	-2.057**	-.66	-113.23	-.44	-2.032**	-.62	-116.14
A3	-.06	-1.172**	-.45	-70.96	-.13	-1.328**	-.46	-81.99	-.17	-1.297**	-.47	-80.46	-.20	-1.277**	-.45	-84.98
a	--	3.634**	--	291.53	--	3.488**	--	292.37	--	3.308**	--	272.51	--	3.123**	--	276.90
$\ln(\overline{X})$			2.72				2.64				2.62				2.57	
ln(SD)			1.12				1.20				1.16				1.17	
R^2			.88				.89				.87				.88	
R^2adj.			.88				.89				.87				.88	
N			3,537				3,865				4,427				4,957	

$^{*}p \le .05$
$^{**}p \le .01$

[1] Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54, A3=ages 55-64.

$$\text{"protection of marriage"} = b^u - b^m$$

where b^u equals the regression slope of unmarried male or female, and where b^m equals the regression slope of married male or female. Married is the reference category of the dummy variable, marital status, thus it equals zero. For example, in Table 5-16, for 1951:

$$\text{"protection of marriage"} = .249 - 0 = .249$$

where the slopes of the regression equation involving mortality of single females minus married females equals .249 (b=.249), the value of the slope of that of single females, indicating that the mortality of married females is lower than for single females in 1951.

In order to determine the extent of the protection of marriage for males, the slopes of the unmarried males and married males were compared with the slopes of the unmarried females and married females. A further table, Table 5-17, was created. To determine the protection of marriage for males, the following equation was developed:

$$\text{"protection of marriage for males"} = (b^u_M - b^m_M) > (b^u_F - b^m_F)$$

where b^u_M equals the regression slope of unmarried males, b^m_M the regression slope of married males, b^u_F the regression slope of unmarried females, and b^m_F the regression slope of

TABLE 5-17

Tests of Significance of the Slopes Between the Sexes (b1 and b2), Using the Logarithm of the General Death Rate, Regressed on Marital Status, and Controlling for Age, by Year, Canada

YEAR	MARITAL STATUS		b1(M)	b2(F)	Δ b1(M)-b2(F)	df(1)	t(2)
	b1	b2					
1951	(Sm-Mm)(3)	(Sf-Mf)	.393**	.249**	.144	12	6.88**
1951	(Wm-Mm)	(Wf-Mf)	.297**	.250**	.047	12	2.19*
1951	(Dm-Mm)	(Df-Mf)	.704**	.319**	.385	12	8.70**
1961	(Sm-Mm)	(Sf-Mf)	.365**	.308**	.057	12	2.79**
1961	(Wm-Mm)	(Wf-Mf)	.188**	.386**	-.198	12	-9.35**
1961	(Dm-Mm)	(Df-Mf)	.794**	.402**	.392	12	1.80*
1971	(Sm-Mm)	(Sf-Mf)	.486**	.387**	.099	12	4.78**
1971	(Wm-Mm)	(Wf-Mf)	.383**	.504**	-.121	12	-5.57**
1971	(Dm-Mm)	(Df-Mf)	.629**	.424**	.205	12	6.74**
1981	(Sm-Mm)	(Sf-Mf)	.651**	.488**	.163	12	7.80**
1981	(Wm-Mm)	(Wf-Mf)	.556**	.613**	-.057	12	-2.60*
1981	(Dm-Mm)	(Df-Mf)	.746**	.457**	.289	12	11.51**

*p≤.05
**p≤.01

(1) df: degrees of freedom. Significance of 't' determined through Students' t distribution for one-tailed test at the .01 and .05 level for 12 degrees of freedom (6+6=12). The critical level for a .05 level of significance is 1.78; for a .01 level, it is 2.68 (Hinkle et al., 1982:184-188,362).

(2) $t=(b1-b2)/\sqrt{SE1^2+SE2^2}$.

(3) Sm=single males; Wm=widowed males; Dm=divorced males; Mm=married males; Sf=single females; Wf=widowed females; Df=divorced females; Mf=married females.

SOURCES: Tables 5-15 and 5-16 and their respective SPSSx output.

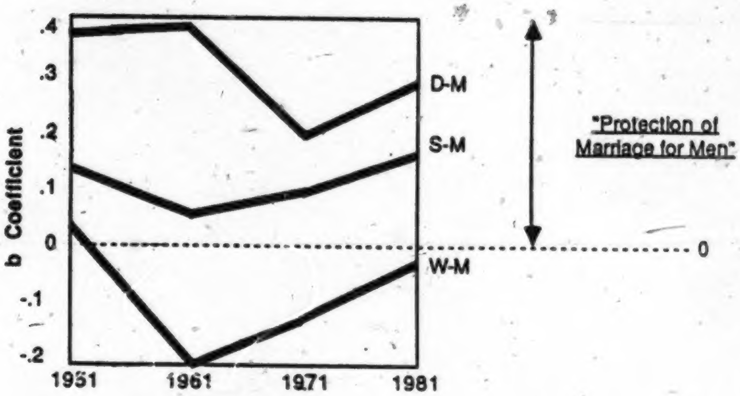
married females. For example, in Table 5-17 for 1951,

> "protection of marriage = $b_1(M) > b_2(F) = .393 > .249$ for males"

it is illustrated that single males would have gained more from marriage (due to their higher mortality as illustated by the steeper slope) in 1951 than would single females. A test of significance for the difference in slopes (a 't' test) was computed, using the formula given in the footnote of the table. These results were all highly significant ($p<.01$ in most cases).

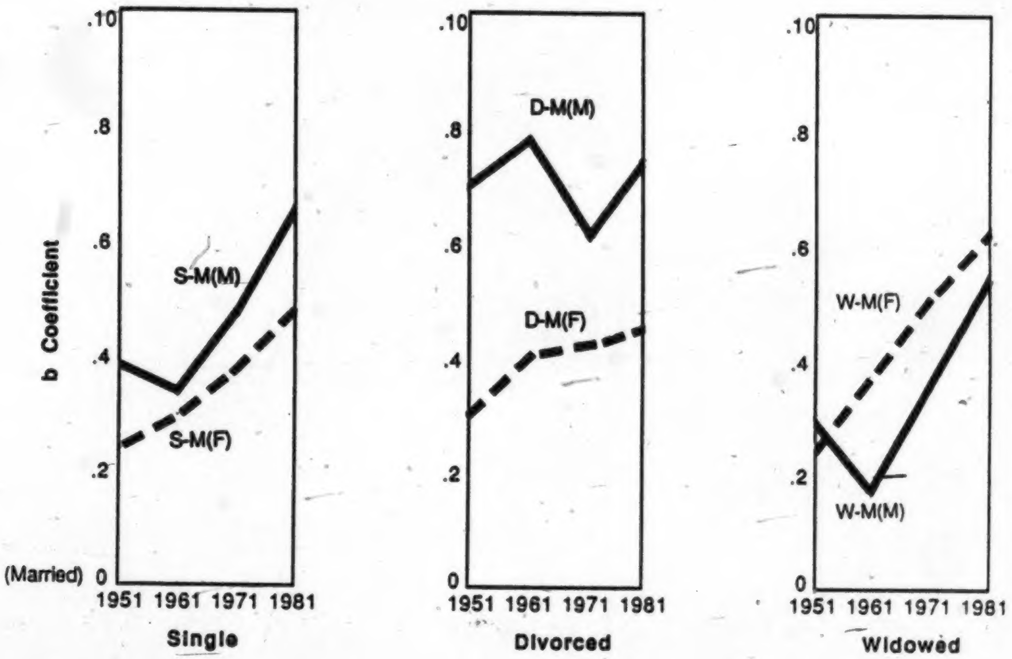
The results of Table 5-17 are further graphed in Figure 5-4. Again, the dividing line of zero separates the regions of potentially higher marriage protection by sex. A value above zero illustrates the greater potential protection of marriage for males; below the line the protection is assumed to be greater for females. Like Chapter 4, the results of mortality for single and divorced males support the protection aspect of marriage for males. Unlike Chapter 4, however, the results of mortality for widowed males do not. The results of mortality for these unmarried states will be analyzed separately.

Looking at Figure 5-4, it is clear that the excess mortality for single males (minus married males) is higher than that of single females (minus married females). This trend seems to be an increasing one over time, illustrating



(SOURCE: Table 5-17)

The b Coefficient (Slope) of the Logarithm of the General Death Rate Regressed on Marital Status, Between Unmarried and Married Men and Women, Graphed by Year, Canada.



(SOURCE: Tables 5-15 and 5-16)

Graphing the b Coefficient of the Logarithm of the General Death Rate Regressed on Marital Status, Conditioning by Sex and Year, Canada.

FIGURE 5-4

that single males would appear to be losing more and more of the potential benefits of marriage (with regard to mortality) than are single females, due to their increasing mortality (relative to those married). Similarly, the divorced males illustrate a similar trend to single males. Although a decline in the divorced males' mortality is shown between 1961 and 1971, it is likely a beneficial effect of lowered social anomie associated with a relaxed divorce law passed in 1968 which made obtaining a divorce easier and with less social stigma for Canadians. Interestingly, the continued decline of the divorced males in Chapter 4 (Figure 4-18) is not evident with the application of multiple regression, but rather a statistically significant relative increase in mortality of divorced males continues after 1971. It would appear then that the decline in mortality was only temporary and was perhaps an effect of changing social values and norms (which accompanied the divorce law changes in 1968). Also of interest is that it is the divorced males' mortality and not the divorced females' mortality which fluctuates (with regard to those married) between 1961 and 1971, implying that divorced males benefitted more by the divorce law changes through decreased mortality, than did divorced females.

Lastly, in Figure 5-4, the mortality for those widowed (with regard to those married), is examined. The higher mortality of widowed females (relative to married females) to widowed males (relative to married males) after 1951 contradicts the findings of Chapter 4 as well as the assumptions of Hypothesis 12. This is because these statistically significant findings demonstrate that marriage would have been potentially more beneficial after 1951 to widowed females than to widowed males. It seems that if mortality trends for those widowed remain the way they were by 1981, then in time, a mortality crossover will possibly occur, demonstrating higher mortality for widowed males, since the mortality differentials between men (widowed minus married) and women (widowed minus married) are narrowing. If this happens, then Gove's argument of greater protection in marriage for (widowed) males will then be supported.

In an attempt to determine why the mortality for widowed females is higher in this analysis than for widowed males, as opposed to the results in the Gove article (1973), it is necessary to compare the two analyses by method, data, etc. Gove used data from one year only, 1960, for the United States for all causes, while our study applies the hypotheses to four different time periods, 1951, 1961, 1971 and 1981. Both studies used the whole population, with the following exceptions: Gove uses the white population only (our study combines all races and nationalities), and Gove starts his age categories at ages 25 (ours starts at age 35). Gove believes that above age 65, biological mortality overrides and masks influences of social factors (p.49), though he includes categories of up to 75+. Indeed, at ages 75+ for general mortality, single female mortality is higher than single male mortality (relative to those married). This effect, however, is absorbed when all the ages are looked at as a whole, 25+. Gove makes use of a mortality ratio, very like the 'coefficient of preservation' as used by Durkheim in his paper on suicide (p.47). Our study makes use of rates (Chapter 4) and regression slopes (Chapter 5) rather than ratios, but the effect should be similar. Perhaps the effect of race or ethnicity accounts for the differences in results.

In the next hypothesis, the same analysis will be undertaken for chronic diseases. Perhaps cardiovascular disease mortality or malignant neoplasm mortality is causing this phenomenon of higher general mortality of the widowed females to widowed males (relative to those married).

Hy13. In an attempt to further test Gove's theory of greater protection in marriage for men, this theory is now applied to chronic disease to see if similar patterns of marital status mortality emerge.

Tables 5-18 and 5-19 show the slopes of mortality for marital status by year and by cause. In both cardiovascular mortality and malignant neoplasm mortality, those married have significantly lower mortality ($p<.01$) than those not married and this is consistent over time. This is also consistent with the findings in Hypotheses 10 and 11.

Similar to Hypothesis 12, a comparison of mortality between those unmarried and married men and women are

TABLE 5-18

Logarithm of the Cardiovascular Disease Death Rate Regressed on Marital Status, Controlling for Sex and Age, 1951 to 1981, for Canada'''

	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	-.01	.286**	.09	18.99	-.00	.301**	.09	19.69	.01	.337**	.10	20.68	.05	.524**	.15	32.69
M2(W)	.27	.435**	.15	30.32	.27	.450**	.15	30.66	.29	.628**	.20	40.43	.28	.731**	.23	48.99
M3(D)	.04	.778**	.11	24.33	.01	.669**	.10	22.76	-.02	.487**	.09	19.65	-.06	.470**	.10	23.31
S1(F)	-.16	-.568**	-.22	-48.01	-.17	-.768**	-.28	-63.79	-.20	-.952**	-.34	-75.21	-.20	-.952**	-.34	-78.79
A1	-.62	-3.424**	-.76	-161.71	-.60	-3.666**	-.74	-162.97	-.57	-3.747**	-.70	-151.46	-.57	-3.811**	-.69	-158.21
A2	-.45	-2.299**	-.63	-131.74	-.45	-2.396**	-.63	-136.85	-.44	-2.395**	-.61	-129.84	-.43	-2.433**	-.60	-133.92
A3	-.13	-1.227**	-.40	-83.42	-.17	-1.371**	-.42	-91.15	-.19	-1.400**	-.42	-89.71	-.22	-1.455**	-.43	-96.74
a	--	3.196**	--	276.29	--	3.307**	--	287.63	--	3.221**	--	267.58	--	2.981**	--	260.96
$\ln(\overline{X})$			2.24				2.26				2.17				2.03	
ln(SD)			1.28				1.34				1.37				1.38	
R^2			.89				.89				.87				.88	
R^2adj.			.89				.89				.87				.88	
N			5,585				6,070				6,425				6,767	

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54; A3=ages 55-64.

TABLE 5-19

Logarithm of the Malignant Neoplasm Death Rate Regressed on Marital Status, Controlling for Sex and Age, 1951 to 1981, for Canada'''

	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	-.01	.188**	.08	14.05	-.01	.189**	.08	14.94	.02	.212**	.08	18.17	.03	.265**	.10	25.27
M2(W)	.26	.245**	.11	19.16	.25	.254**	.11	20.89	.25	.297**	.13	26.29	.25	.373**	.16	38.11
M3(D)	.06	.723**	.13	24.80	.07	.617**	.13	26.99	.02	.410**	.10	23.37	-.02	.379**	.12	29.76
S1(F)	-.09	-.038**	-.02	-3.62	-.18	-.237**	-.12	-24.24	-.21	-.367**	-.18	-41.31	-.23	-.453**	-.22	-59.03
A1	-.69	-2.648**	-.85	-149.39	-.68	-2.743**	-.82	-163.03	-.66	-2.773**	-.80	-175.65	-.68	-2.913**	-.80	-208.03
A2	-.40	-1.581**	-.61	-107.07	-.42	-1.694**	-.62	-122.83	-.44	-1.712**	-.62	-135.35	-.43	-1.721**	-.60	-154.78
A3	-.02	-.766**	-.33	-58.48	-.06	-.879**	-.36	-71.23	-.07	-.855**	-.36	-77.35	-.06	-.821**	-.34	-86.65
a	--	2.044**	--	194.45	--	2.221**	--	230.28	--	2.334**	--	266.15	--	2.377**	--	315.40
$\ln(\overline{X})$			1.42				1.48				1.56				1.62	
ln(SD)			.97				1.02				1.02				1.03	
R'			.88				.89				.90				.91	
R'adj.			.88				.89				.90				.91	
N			4,232				4,806				5,548				6,396	

* $p \leq .05$
** $p \leq .01$

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54, A3=ages 55-64.

compared. Tables 5-20 and 5-21 show the mortality slopes between the unmarried males and females due to cardiovascular disease mortality, while Tables 5-22 and 5-23 show a comparison of marital status mortality due to malignant neoplasm mortality. These results are analyzed further in Tables 5-24 and 5-25, and these Tables are depicted in Figures 5-5 and 5-6.

With cardiovascular disease, in at least one time period, divorced and widowed females (relative to married females) have higher mortality than divorced and widowed males (relative to married males), disproving Gove's theory of men benefitting more from marriage than women.[42] Only the results of those widowed females, however, were statistically significant, and not those of the divorced females (Table 5-24). These results of higher cardiovascular mortality for widowed females than for widowed males might account for the higher general mortality of widowed females as discussed in Hypothesis 12. Single males (relative to married males) had higher mortality than single females (relative to married females) at all points except 1961 whereby the two slopes intersected. This intersection, however, is not statistically significant, as shown in Table 5-24. Gove, in his article (1973), does not specifically examine marital status mortality by cardiovascular disease, so no direct comparisons with his data are possible. Our

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[42] The higher the mortality of the unmarried (relative to those married) with regard to the other sex, the more that those with unmarried status would have benefitted from, or have been protected within, marriage.

TABLE 5-20

Logarithm of the Cardiovascular Death Rate Regressed on Marital Status, Controlling for Age and Conditioning by Year and Sex, Canada'''

	MALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	-.02	.296**	.11	18.53	.00	.288**	.10	19.03	.02	.340**	.12	22.95	.05	.519**	.17	34.79
M2(W)	.30	.454**	.16	27.18	.28	.382**	.13	23.62	.33	.608**	.20	38.15	.32	.659**	.21	41.51
M3(D)	.07	.865**	.15	26.60	.04	.651**	.12	23.12	.01	.552**	.12	24.78	-.03	.553**	.15	29.75
A1	-.67	-3.255**	-.81	-140.98	-.66	-3.338**	-.82	-153.90	-.66	-3.435**	-.80	-157.36	-.64	-3.506**	-.78	-160.96
A2	-.44	-2.015**	-.63	-108.45	-.45	-2.065**	-.64	-119.68	-.44	-2.039**	-.63	-123.37	-.44	-2.126**	-.63	-127.81
A3	-.08	-1.025**	-.37	-63.84	-.11	-1.130**	-.40	-74.06	-.11	-1.104**	-.39	-76.08	-.16	-1.203**	-.41	-83.97
a	--	3.078**	--	272.00	--	3.186**	--	304.39	--	3.065**	--	304.64	--	2.858**	--	295.05
ln($\overline{X}$)		2.42				2.46				2.41				2.27		
ln(SD)		1.16				1.19				1.20				1.21		
R^2		.91				.91				.91				.92		
R^2adj.		.91				.91				.91				.92		
N		3,135				3,473				3,686				3,815		

* $p \leq .05$
** $p \leq .01$

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54, A3=ages 55-64.

TABLE 5-21

Logarithm of the Cardiovascular Disease Death Rate Regressed on Marital Status, Controlling for Age and Conditioning by Year and Sex, Canada'''

	FEMALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	-.02	.250**	.07	9.60	-.02	.294**	.08	11.10	-.01	.295**	.08	9.83	.04	.472**	.12	16.12
M2(W)	.31	.390**	.13	17.44	.33	.476**	.15	21.11	.35	.583**	.19	23.41	.37	.725**	.23	30.60
M3(D)	-.01	.600**	.07	10.04	-.04	.731**	.09	13.56	-.06	.350**	.06	7.54	-.12	.303**	.06	8.11
A1	-.60	-3.638**	-.74	-102.88	-.59	-4.209**	-.69	-102.89	-.55	-4.270**	-.64	-88.65	-.56	-4.335**	-.63	-93.29
A2	-.49	-2.710**	-.65	-89.75	-.51	-2.911**	-.64	-94.94	-.51	-2.979**	-.62	-85.37	-.49	-2.934**	-.59	-85.73
A3	-.20	-1.485**	-.44	-60.64	-.26	-1.691**	-.45	-67.25	-.30	-1.806**	-.47	-65.28	-.32	-1.794**	-.46	-67.65
a	--	2.781**	--	156.09	--	2.688**	--	151.00	--	2.471**	--	125.05	--	2.195**	--	115.96
$\ln(\overline{X})$		2.01				1.99				1.85				1.73		
ln(SD)		1.39				1.48				1.51				1.51		
R²		.89				.89				.87				.87		
R²adj.		.88				.89				.87				.87		
N		2,450				2,598				2,739				2,952		

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54, and A3=ages 55-64.

TABLE 5-22

Logarithm of the Malignant Neoplasm Death Rate Regressed on Marital Status, Controlling for Age and Conditioning by Year and Sex, Canada'''

	MALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	-.06	.156**	.06	9.63	-.04	.165**	.06	10.75	-.03	.177**	.07	11.72	.01	.293**	.10	21.17
M2(W)	.29	.374**	.15	22.73	.27	.300**	.11	18.63	.29	.360**	.13	22.35	.28	.477**	.16	33.01
M3(D)	.11	.854**	.16	25.74	.09	.747**	.15	27.71	.02	.388**	.09	16.79	-.00	.469**	.13	27.70
A1	-.70	-3.092**	-.83	-131.77	-.68	-3.227**	-.81	-144.05	-.67	-3.167**	-.81	-145.89	-.68	-3.322**	-.81	-168.53
A2	-.44	-1.825**	-.62	-98.13	-.47	-2.018**	-.65	-114.31	-.48	-2.026**	-.66	-117.69	-.47	-2.005**	-.64	-131.30
A3	-.05	-.834**	-.33	-52.08	-.09	-.985**	-.37	-64.58	-.09	-.984**	-.38	-67.10	-.08	-.938**	-.36	-73.07
a	--	2.110**	--	187.96	--	2.325**	--	222.63	--	2.443**	--	242.23	--	2.446**	--	278.02
$\ln(\overline{X})$	1.51				1.65				1.77				1.85			
ln(SD)	1.06				1.11				1.11				1.11			
R^2	.92				.93				.92				.93			
R^2adj.	.92				.93				.92				.93			
N	2,124				2,461				2,834				3,260			

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54, A3=ages 55-64.

TABLE 5-23

Logarithm of the Malignant Neoplasm Death Rate Regressed on Marital Status, Controlling for Age and Conditioning by Year and Sex, Canada(1)

	FEMALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	.05	.243**	.12	13.97	.03	.238**	.11	15.19	.07	.287**	.13	20.42	.05	.263**	.11	21.86
M2(W)	.27	.165**	.09	10.48	.30	.245**	.13	17.53	.31	.289**	.15	23.21	.33	.325**	.17	31.95
M3(D)	-.04	.479**	.09	11.65	.02	.448**	.10	15.22	.02	.433**	.13	21.02	-.06	.286**	.10	19.84
A1	-.71	-2.281**	-.89	-106.58	-.70	-2.318**	-.87	-120.92	-.70	-2.386**	-.84	-133.66	-.72	-2.528**	-.85	-168.83
A2	-.36	-1.338**	-.60	-72.38	-.38	-1.367**	-.61	-84.27	-.41	-1.392**	-.61	-96.40	-.42	-1.430**	-.60	-117.42
A3	.01	-.679**	-.33	-40.22	-.03	-.745**	-.36	-49.50	-.03	-.703**	-.34	-54.32	-.05	-.690**	-.33	-65.68
a	--	1.914**	--	148.22	--	1.843**	--	161.64	--	1.821**	--	179.98	--	1.835**	--	226.04
$\ln(\overline{X})$			1.34				1.29				1.34				1.38	
ln(SD)			.86				.87				.87				.88	
R'			.88				.90				.91				.93	
R'adj.			.88				.90				.91				.93	
N			2,108				2,345				2,714				3,136	

* p≤.05
** p≤.01

(1) Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8. A1=ages 35-44, A2=ages 45-54, A3=ages 55-64.

TABLE 5-24

Tests of Significance of the Slopes Between the Sexes (b1 and b2), Using the Logarithm of the Cardiovascular Disease Death Rate, Regressed on Marital Status, Controlling for Age, by Year, Canada

YEAR	MARITAL STATUS		b1(M)	b2(F)	Δb1(M)-b2(F)	df[1]	t[2]
	b1	b2					
1951	(Sm-Mm)[3]	(Sf-Mf)	.296**	.250**	.046	12	1.51
1951	(Wm-Mm)	(Wf-Mf)	.454**	.390**	.064	12	2.30*
1951	(Dm-Mm)	(Df-Mf)	.865**	.600**	.265	12	3.90**
1961	(Sm-Mm)	(Sf-Mf)	.288**	.294**	-.006	12	-.20
1961	(Wm-Mm)	(Wf-Mf)	.382**	.476**	-.094	12	-3.39**
1961	(Dm-Mm)	(Df-Mf)	.651**	.731**	-.080	12	-1.32
1971	(Sm-Mm)	(Sf-Mf)	.340**	.295**	.045	12	1.35
1971	(Wm-Mm)	(Wf-Mf)	.608**	.583**	.025	12	.85
1971	(Dm-Mm)	(Df-Mf)	.552**	.350**	.202	12	3.99**
1981	(Sm-Mm)	(Sf-Mf)	.519**	.472**	.047	12	1.43
1981	(Wm-Mm)	(Wf-Mf)	.659**	.725**	-.066	12	-2.32*
1981	(Dm-Mm)	(Df-Mf)	.553**	.303**	.250	12	5.99**

*p≤.05
**p≤.01

[1] df: degrees of freedom. Significance of ‘t’ determined through Students’ t distribution for one-tailed test at the .01 and .05 level for 12 degrees of freedom (6+6=12). The critical level for a .05 level of significance is 1.78; for a .01 level, it is 2.68 (Hinkle et al., 1982:184-188,362).

[2] $t=(b1-b2)/\sqrt{SE1^2 + SE2^2}$.

[3] Sm=single males; Wm=widowed males; Dm=divorced males; Mm=married males; Sf=single females; Wf=widowed females; Df=divorced females; Mf=married females.

SOURCES: Tables 5-20 and 5-21 and their respective SPSSx output.

TABLE 5-25

Tests of Significance of the Slopes Between the Sexes (b1) and b2), Using the Logarithm of the Malignant Neoplasm Death Rate, Regressed on Marital Status, Controlling for Age, by Year, Canada

YEAR	MARITAL STATUS		b1(M)	b2(F)	Δ b1(M)-b2(F)	df(1)	t(2)
	b1	b2					
1951	(Sm-Mm)(3)	(Sf-Mf)	.156**	.243**	-.087	12	-3.67**
1951	(Wm-Mm)	(Wf-Mf)	.374**	.165**	.209	12	9.17**
1951	(Dm-Mm)	(Df-Mf)	.854**	.479**	.375	12	7.10**
1961	(Sm-Mm)	(Sf-Mf)	.165**	.238**	-.073	12	-3.33**
1961	(Wm-Mm)	(Wf-Mf)	.300**	.245**	.055	12	2.58*
1961	(Dm-Mm)	(Df-Mf)	.747**	.448**	.299	12	7.49**
1971	(Sm-Mm)	(Sf-Mf)	.177**	.287**	-.110	12	-5.33**
1971	(Wm-Mm)	(Wf-Mf)	.360**	.289**	.071	12	3.49**
1971	(Dm-Mm)	(Df-Mf)	.388**	.433**	-.045	12	-1.45
1981	(Sm-Mm)	(Sf-Mf)	.293**	.263**	.030	12	1.64
1981	(Wm-Mm)	(Wf-Mf)	.477**	.325**	.152	12	8.61**
1981	(Dm-Mm)	(Df-Mf)	.469**	.286**	.183	12	8.23**

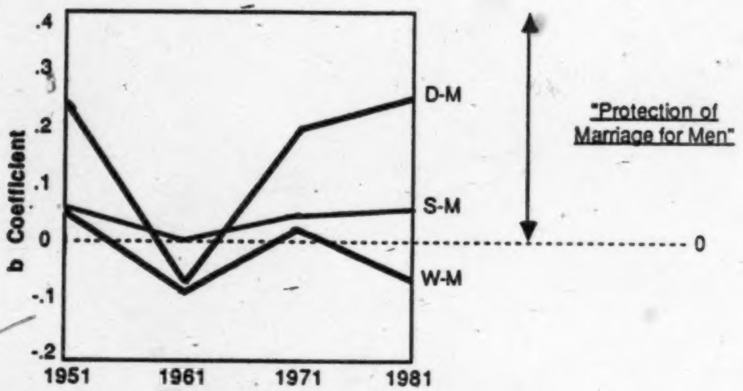
*p≤.05
**p≤.01

(1) df: degrees of freedom. Significance of 't' determined through Students' t distribution for one-tailed test at the .01 and .05 level for 12 degrees of freedom (6+6=12). The critical level for a .05 level of significance is 1.78; for a .01 level, it is 2.68 (Hinkle et al., 1982:184-188,362).

(2) $t=(b1-b2)/\sqrt{SE1^2 + SE2^2}$.

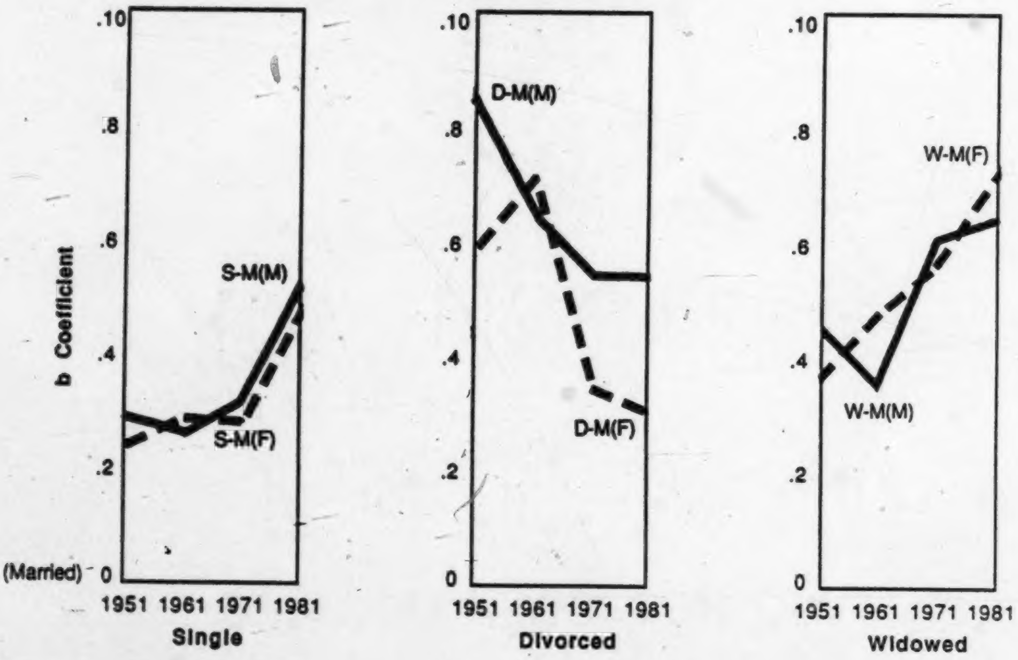
(3) Sm=single males; Wm=widowed males; Dm=divorced males; Mm=married males; Sf=single females; Wf=widowed females; Df=divorced females; Mf=married females.

SOURCES: Tables 5-22 and 5-23 and their respective SPSSx output.



(SOURCE: Table 5-24)

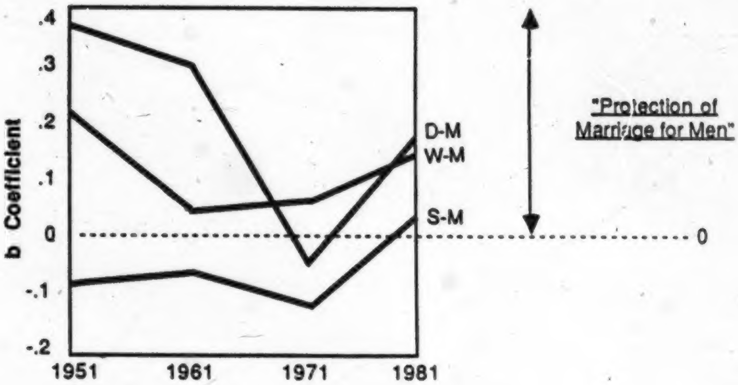
The b Coefficient of the Logarithm of the Cardiovascular Death Rate Regressed on Marital Status, Between Unmarried and Married Men and Women, Graphed by Year, Canada.



(SOURCE: Tables 5-20 and 5-21)

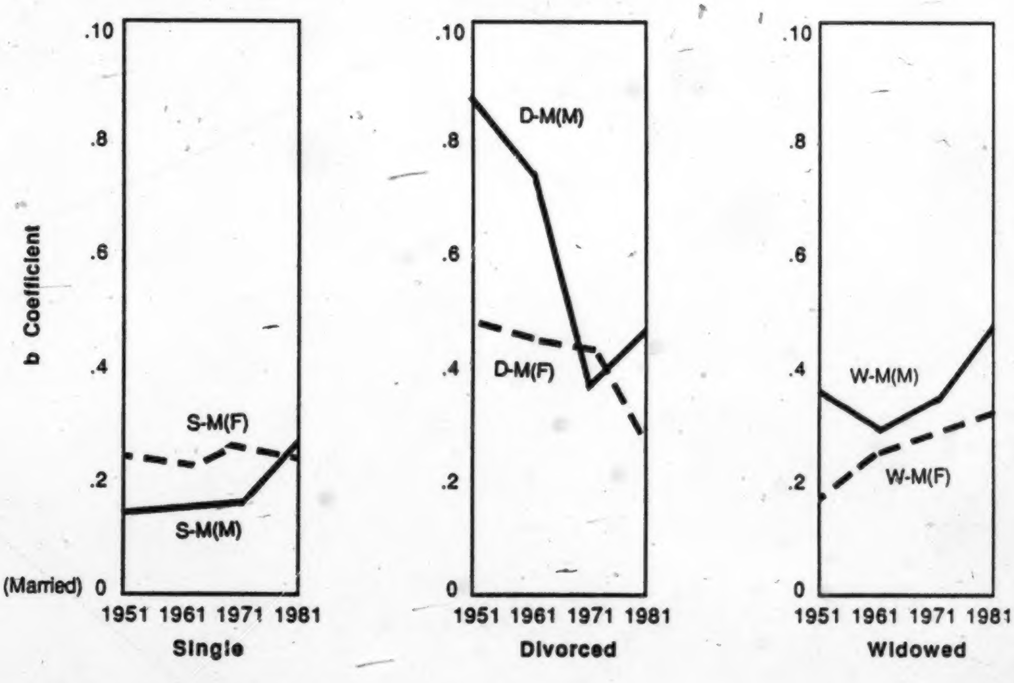
Graphing the b Coefficient of the Logarithm of the Cardiovascular Disease Death Rate, Regressed on Marital Status, Conditioning by Sex and Year, Canada.

FIGURE 5-5



(SOURCE: Table 5-25)

The b Coefficient of the Logarithm of the Malignant Neoplasm Death Rate Regressed on Marital Status, Between Unmarried and Married Men and Women, Graphed by Year, Canada.



(SOURCE: Tables 5-22 and 5-23)

Graphing the b Coefficient of the Logarithm of the Malignant Neoplasm Death Rate, Regressed on Marital Status, Between Unmarried and Married Men and Women, Graphed by year, Canada.

FIGURE 5-6

results suggest that it would have been appropriate for Gove to have studied cardiovascular disease mortality in 1960, as 1961 results displayed higher mortality for the divorced and widowed females than the divorced and widowed males (relative to those married).

Regarding malignant neoplasm mortality, single and divorced females (relative to married females) have higher mortality than single and divorced males (relative to married males) during at least one time period. The mortality of widowed males is consistently higher than widowed females (both relative to those married) although over time, the slope of male mortality increases, implying that widowed males would have increasingly benefitted from the protection aspect of marriage. Similarly, Gove (1973) studied lung cancer by marital status in 1960 and found that for ages 25+, married males had lower mortality than married females and unmarried males (p.55), and that single females 25-34 and widowed females 75+ had higher death rates of lung cancer than single and widowed males and married males and females.

Gove specifically studied those types of mortality where one's psychological state would appear to affect one's life chances (p.65), although he also studied causes of death which appear to be affected by social factors, like unhealthy life style (excessive drinking, and smoking). Thus, his results should be applicable to our study as the attempt has been made to also study mortality which would appear to be affected by social factors. Chronic disease mortality, however, for all unmarried statuses, and during at least one period in time, disprove Gove's theory of a protection aspect of marriage for males, due to higher significant mortality of unmarried females (relative to mortality of married females as well as unmarried and married males).

VI. CONCLUSION

A. Summary of Results

Following is a summary of results from chapters 4 and 5 with regard to demograpahic factors, marital status composition effects and regional effects. The major findings related to the hypotheses are emphasized.

Demographic Factors

1. Age. Canada is indeed an aging country as illustrated by Hypothesis 1 through Canada's increasing median age over time. Canada is also in the last stages of Demographic Transition as indicated by its declining death rate over time.

According to the Epidemiological Transition Theory (Omran, 1971), Modernization Theory (Cowgill, 1974), and Developmentalist Theory (Goldscheider, 1971) as industrialized countries continue to develop, there should be an increase in man-made, chronic diseases, even though the general death rate declines overall. With Hypothesis 2, it was found that this was true for malignant neoplasms in Canada, but not for cardiovascular disease, which has been on the decline since approximately 1960. There seemed to be two explanations for this decline: either the Epidemiological Transition was completed by 1960 and can no longer explain recent chronic disease changes; or as Olshansky and Ault (1986) suggest, there may be a fourth stage in the Epidemiological Transition involving mortality compression at the oldest ages (leading perhaps to a final stage of compression, ultimately ending in natural mortality?), due to mortality decline at the youngest ages over time.

Olshansky and Ault's (1986) theory of mortality compression built on Fries' (1980) theory of morbidity compression, and was tested in Hypothesis 3. Here, death rates were examined over time by age, and the use of both rates and regression analysis confirmed that mortality compression was evident with malignant neoplasm mortality. The techniques disagreed about mortality compression in cardiovascular disease mortality and chronic disease mortality overall: through the application of rates, mortality compression was rejected for cardiovascular disease mortality and chronic disease rates, although regression analysis supported it. Since regression analysis is a more refined measure than rates in general, the conclusion that the theory of mortality compression exists at older ages was supported for chronic diseases.

To further explore the concept of mortality compression, a supplemental hypothesis was tested: the life style hypothesis (Weatherby et al., 1983). Developed from the Modernization Theory (Cowgill, 1974) and the Developmentalist Theory (Goldscheider, 1971), the life style theory associates the decline in general death rates over time to the improved health technology and levels of living which accompany economic development. It is believed that this process, while lowering the general mortality rate, may similarly contribute to increase the levels of mortality from chronic disease. At younger ages this increase may be due to unhealthy life style changes (at older ages, biological degeneration likely plays an increasing role in mortality). The extent to which life style may have an effect on mortality is thought to be inferred through the use of a ratio between chronic and general death rates.

The results of Hypothesis 4 showed that unhealthy life styles at early ages increases mortality, as the mortality ratio for malignant neoplasms displayed increasing risk over time for the earliest age groups. Cardiovascular disease mortality and chronic disease mortality, however, did not support the hypothesis. The implication from these results was that negative life style habits like smoking, excessive drinking, et cetera seemed to increase cancer rates, while positive life style changes like increased exercise, decreased chloresterol intake and cardiovascular disease screening seem to be decreasing mortality from cardiovascular disease. Thus it may be that the two types of chronic diseases respond to different aspects of life style. It also was decided not to study chronic disease as an aggregate due to the apparent conflicting trends of cardiovascular disease mortality and malignant neoplasm mortality.

2. Gender. Sex, as well as age, appears to have great significance on mortality. It is thus important to study its effects separately.

The 'nature or nurture' aspect of mortality by gender is an ongoing debate; that is, is it biology or socialization which gives women an advantage when it comes to mortality? This thesis attempts to provide support for the theory that mortality differences are due to the 'nurture' aspect, due to different life styles, and the different social roles of the sexes.

First, the assumption that males have a consistently higher death rate than females (Tomasson, 1984; Atchley, 1972) in Canada was tested. Hypothesis 5, through the results of both rates and multiple regression, show support for a consistently higher general death rate for males in Canada, implying that males' life styles are more deleterious to their health than are females'. In addition, an unbalanced sex ratio in the favour of women occurs, especially with increasing age.

Even though the male's death rate is consistently higher than female's, Goldscheider's Developmentalist Theory (1971) suggests that improvements in health and living standards should translate into decreasing death rates for both sexes over time. Both descriptive and regression analyses, in Hypothesis 6, supported this theory. It was demonstrated that general death rates for both sexes have been decreasing over time in Canada, with minor fluctuations by region.

Returning to the life style hypothesis (Weatherby et al., 1983) it was hypothesized that differences in mortality between the sexes are caused by life style factors. Much of the increase in male excess mortality this century appears to have resulted from the widespread adoption of hazardous life styles by men and a general mismanagement of individual health, largely regulated by sex roles and social conventions governing the behaviour of males and females (Hetzel, 1983; Lopez, 1983). Greater stresses to the physiology system such as smoking (Retherford, 1975) and occupational stress (Waldron, 1976) experienced more by men, may help to explain the higher male death rate, due to a 'masculine sex role' (Gove and Hughes, 1979; Nathanson, 1984). With an increasing number of women adopting this 'masculine sex role', it is anticipated that the death rates between the sexes will be narrowing. A ratio of female to male general death rates was created as a test of relative mortality.

Results in Hypotheses 6 and 7 showed that for most of the ages in Canada overall, this mortality ratio declined until 1961 or 1971, indicating continued, higher general death rate by males. By 1981, however, an increase in the mortality ratio (in many cases statistically significant) has been noted. This increase depicted the male's general death rate as continuing to decline, while the female's rate of mortality decline decreased, supporting the suggestion that negative life style habits may be beginning to be increasingly harmful to females due to their decreased mortality decline. **Thus, life style factors appear to affect differences in general mortality between the sexes.**

The next question was whether life style factors also affected differences in chronic disease mortality between the sexes. The results from Hypothesis 8 indicated that for cardiovascular disease, women's rates of mortality were significantly lower (p<.01) than males of the same age, regardless of year or region. For malignant neoplasm mortality, however, it was shown that female mortality at ages 35-44 and 45-54 was higher than male's during at least one or two time periods, and in most cases, it remained higher over the entire three decades (p<.01). By ages 55-64, the male cancer rate quickly outstripped that of the female's. It was suggested that this higher cancer rate for women at earlier ages was likely due to breast and/or lung cancer, while the increased mortality of males at older ages was probably due to lung cancer.

Life style factors thus also appear to cause differences in chronic disease mortality between the sexes.[43] The adoption of a 'masculine sex role', however, appears to not always result in higher mortality for males, as indicated by higher cancer mortality at early ages by females.

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[43] This supports Samuel H. Preston's (1976) study of mortality patterns which suggests that in a broad sense that economic modernization and urbanization operate through cardiovascular disease, which contributes to sex mortality differentials (p.45).

To further test the life style hypothesis, it was suggested that as women adopt more of the 'masculine sex role' (i.e., negative health habits associated with this role), differences between the chronic disease death rates of men and women should be decreasing over time. As in Hypothesis 7, a ratio between men and women was adopted in Hypothesis 9, this time for chronic disease rates.

Similar to Hypothesis 7, a 'u-shape' pattern of mortality (i.e., decrease-stabilize-increase) was observed with both cardiovascular disease and malignant neoplasm mortality in Hypothesis 9. Thus, modernization and life style factors have, since 1971, seemingly affected the female-male ratio of chronic diseases overall by narrowing the differences of the rates between the sexes. The upward trend of mortality since 1971 indicated female mortality as being affected increasingly deleteriously from life style factors (as shown by a decreased decline in mortality for females). The oldest ages often show a continued decline in mortality (i.e., a widening of male and female death rates), but at these older ages, it is suspected that women do not adopt the same degree of harmful aspects of the 'masculine sex role' as do younger women in the labour force age group. More research is needed here, especially testing younger ages than 35 to see if younger women's death rates are more adversely affected than are older women's death rates. The data in this thesis do not appear to fully test this 'masculine sex role' theory.

Marital Status Composition Effects

It has been repeatedly observed that marital status is associated with level of mortality for both sexes. Death rates for most diseases have generally been found to vary from lowest to highest in the following order: married, single, widowed, and divorced. In the Canadian data, those married indeed had the lowest general mortality (Hypothesis 10 and 11) as well as the lowest cardiovascular disease mortality and malignant neoplasm mortality (Hypothesis 13) during the years studied. This is in keeping with the 'protection' theory of marriage as promoted by Gove (1973) and Kobrin and Hendershot (1977).

The unmarried status in rank order, however, varied with year, region, and disease. For instance, a dramatic decrease in mortality by the divorced was determined between 1961 and 1971 for general mortality (Chapter 5) and for malignant neoplasm mortality (Chapter 4); and from 1961 on for general mortality and cardiovascular disease mortality (Chapter 4). This decrease was likely affected by the federal Divorce Law changes made in 1968. Conversely, an increase in mortality over time by those widowed, for general mortality (Chapter 5) and malignant neoplasm mortality (Chapter 4), was also discovered.

Further to the 'protection' (vs. the 'selection') aspect of marriage, Gove (1973) suggests that men are more protected by the benefits of marriage than are women. It was hypothesized that if the difference between the general death rate of nonmarried men and married men was greater than the difference between the rate of nonmarried women and married women, then the protection effect of marriage as benefitting men more could be supported (Hypothesis 12).

The analysis of rates in Chapter 4 supported Gove's theory of men being protected more by marriage than women. Regression analysis in Chapter 5, however, disproved the theory due to higher mortality of widowed females (relative to married females and to widowed and married males) after 1951. These statistically significant findings demonstrated that marriage would have been potentially more beneficial after 1951 to widowed females than to widowed males. The differential between widowed females and widowed males (relative to married females and males), however, is narrowing, indicating a possible mortality crossover sometimes in the late 1980's, if the indicated slope of increase continues.

Similarly, a test for greater protection of marriage for males was conducted with chronic disease mortality data (Hypothesis 13). In Chapter 4, for cardiovascular disease mortality, the unstandardized mortality of single females was higher than single males in Canada at most points, and the standardized mortality for divorced females in the Atlantic region prior to 1981 was found to be higher than that of divorced males (all relative to married females and males). In Chapter 5, however, divorced and widowed females (relative to married females) had higher mortality in Canada than did divorced and widowed males (relative to married males) during at least one time period. Only the results of those widowed females, however, were statistically significant.

In Chapter 4, the malignant neoplasm mortality was higher for single females than single males (relative to married females and males) at most points. In Chapter 5, single and divorced females had higher mortality than single and divorced males (relative to those married females and males) and in most cases these findings were statistically significant.

Gove's (1973) theory of greater protection of marriage for males was thus disproved with chronic disease mortality as well as with general mortality.

Regional Effects

Region was believed to play a significant role, independent of social demographic factors, affecting the mortality experience of a given locality (Trovato and Halli, 1983). Thus, region was included in the analysis of rates and also in the regression equation as a predictor and control variable.

In Hypothesis 2, the percentage change in chronic disease mortality by region from 1951 to 1981 (Table 4-2) supported the notion that region provides an important variable in mortality variance. For example, for cardiovascular disease mortality, the percentage of change in rates from 1951 to 1981 for Canada was -31.9%: the percentage of change ranges from -12.9% in the Atlantic region to -36.5% change in the British Columbia region. Similarly, for malignant neoplasm mortality, the rate of change for Canada is 11.0%: the percentage of change ranges from 1.7% for Quebec to 17.4% in the Atlantic. This implies that the Atlantic region is less healthy than Canada, overall, since the decline of cardiovascular disease is less than Canada's and the rate of cancer is more than Canada's. Conversely, the British Columbia region seems to be more healthy than Canada, overall, due to a higher rate of cardiovascular disease mortality decrease. Also, Quebec's rate of cancer increase over the past 30 years seems to be much less than Canada's overall, raising questions about assumptions of higher lung cancer in Quebec due to heavy smoking in that part of Canada (see footnote 7 in Chapter 4).

Results in the rest of the thesis, however, do not provide such clear-cut evidence of regional differences. In fact, when region is entered as a predictor variable into the regression equations in Chapter 5, less than an extra 5% of R^2 is explained by the variable, and often less than 1% when conditioning by year. The use of region was helpful however, when conditioning by age. For instance, in Hypothesis 9 in Chapter 5, for age 35-44 for malignant neoplasm mortality, 24% additional variance is explained when region is added to the regression equation: 17% is due to British Columbia, and 7% to Ontario (relative to the reference category, the Prairies region). Generally, however, this additional variance by age is minimal and often region explains no more than 7 or 8% additional variance when added to the regression equation.

Possible east-west patterns of mortality were studied, with no conclusive evidence. In Hypothesis 9 in Chapter 5, it seemed as though western regions (British Columbia in particular) accounted for much of the variance at earlier ages in cardiovascuclar disease mortality, while more easterly regions (Atlantic and Quebec) accounted for variance at the oldest ages. The regression equation, however, only indicated Quebec at age 70+ as being statistically significant, so support for this hypothesis could not be made.

The only evidence of regional mortality differences which emerged in the study were those of the 'culture lag' theory (Obgurn and Nimkoff, 1958), discussed in Hypotheses 7, 9, and 10. For instance, in Hypotheses 7 and 9, a ratio was tested for the life style hypothesis, and in all regions, except for Quebec and the Atlantic for certain ages, the ratio of female to male mortality was narrowing, indicating a recent negative effect of life style for females. Quebec and the Atlantic, however, did not show this pattern at the same time as the other regions, but did later, indicating a 'culture lag', due to perhaps geographic isolation, or to an initial rejection of different and recent life style trends. Even so, unfortunately, many of the results were statistically insignificant, implying no conclusive evidence for the 'culture lag' theory.

When examining mortality by marital status, region accounted for less than 1% of additional explained variance of the regression equation, thus region was excluded from further analyses.

In summary, except for the situation where age was a conditioning variable (and even then, not in all cases), region did not appear to be a significant variable in explaining mortality variation in this study once relevent variables were introduced to the multivariate analysis.

B. Effects of the Variables

In order to determine variable correlations and slopes, the logarithm of the death rates was regressed on all the variables entered into a regression equation. The results are shown in the recursive models in Figures A-1 through A-3 (in the Appendix).

All the variables are shown to be highly significant. Age, sex, and marital status appear to have the greatest effect on mortality, followed by effects by year and region. The least correlation appears to exist between region and sex, or region and year. This seems to be consistent for general mortality, cardiovascular disease mortality and malignant neoplasm mortality.

The slopes of the variables reflect results discovered earlier in the thesis. For instance, a positive slope occurs for age, demonstrating that with increasing age, mortality increases. The slope is negative for sex, indicating that females have consistently lower mortality than males. For malignant neoplasm mortality, however, the slope is the lowest of the three, indicating that female mortality is not much lower than males'. In fact, higher female mortality at earlier ages was demonstrated in Hypothesis 8. This would account for the smaller slope for malignant neoplasm mortality as compared to cardiovascular disease mortality and general mortality, where male mortality was consistently higher than females'.

The slope for marital status shows that those married (the reference group) have consistently lower mortality than those not married, due to the positive value of the b coefficients. The malignant neoplasm mortality slope for the unmarried is smaller than the mortality slopes of the other causes of death for the unmarried, indicating that the mortality for the married is higher for malignant neoplasm mortality than for cardiovascular disease mortality or general mortality overall. This was shown in Hypothesis 13.

Mortality over time demonstrates that general mortality and cardiovascular disease mortality has been decreasing. Malignant neoplasm mortality however, has increased over time as shown by the positive b value. This reinforces results from Hypothesis 2.

Lastly, region does not appear to have much effect on mortality as illustrated by the zero b coefficient. The only slight effect is for malignant neoplasm mortality (Figure A-3) where a small negative value is found (b=-.01), indicating that one of the regions (likely ~~British Columbia~~) is showing lower mortality than the Prairies region (the reference category). These results also support the earlier conclusion that region is not a highly significant variable in explaining mortality variation in Canada.

C. Implications

Age and Chronic Disease Mortality

As reinforced by this thesis, Canada's population is an aging one, indicating that the number of older Canadians has, and will be, increasing. With increasing age comes increasing degenerative disease. For instance, it is estimated that as much as 75% of the population over the age of 65 have some type of chronic disease (Penning and Krishnan, 1980:23). Since chronic disease is believed to be a degenerative disease formed over time, people in their later years tend to be the greatest sufferers, as indicated by the phenomenon of mortality compression (Fries, 1980; Olshansky and Ault, 1986).

Of chronic diseases, cardiovascular disease and malignant neoplasms represent the largest proportion, and perhaps as much as 80 percent of all mortality (Manton, 1982:187).

For cardiovascular disease, for instance, it is difficult to assess the many factors that may have contributed to its recent decline. Major factors include the development of effective therapy for hypertension, and increased professional and public awareness concerning cardiovascular and cerebrovascular risk factors. Changes in life style over the recent past have involved increased exercise levels and reduced cigarette smoking and chloresterol, animal fat, and sodium intake. Other factors include improved technical management of cardiovascular disease, including intensive care units, coronary bypass surgery, more effective emergency medical services, chemotherapy, and antibiotics (Stavig et al., 1986:48).

Like all other mass onslaughts of disease, the cardiovascular disease epidemic has resulted from 'disturbances of human culture' (Stamler, 1985:20). As in all medical care and public health endeavors to prevent and control mass disease, the task in regard to cardiovascular disease is to break links in the chain of causation at every accessible point. This implies a multi-faceted attack related to all age groups and all stages of the disease. This will likely include cessation of smoking, treating high blood pressure, and lowering chloresterol and glucose levels in the diet (Levy, 1981:61-62).

Malignant neoplasms (cancer), a heterogeneous collection of diseases, appears to be strongly dependent upon the basic physiological aging processes (Manton, 1984:283). This implies a rising cancer death rate in the future, as the population ages. But since the anatomic site of cancer varies widely, this suggests a number of related factors may be important in cancer causation, including environmental, behavioural, cultural and dietary variables (Higginson, 1980:448).

For a number of cancers the causal factors have been identified with some certainty. One of the most important is cigarette smoking, a social and life style factor. The habit is calculated to be the cause of about 85% of all lung cancers in the United Kingdom and about 35% of all cancers in males in North America, England, and Japan (Higginson, 1980:454).[44] In fact, the rate of death from cancer and other neoplasms has been described as a linear function of cigarette smoking (Keys, 1980; Kristein, 1984:319).

If the paradigm that cancer is caused by exposure to carcinogens and becomes increasingly lethal with time is accepted, then there are four strategies for mortality reduction: reducing the prevalence of exposure to carcinogens; reducing the susceptibility of those so exposed; increasing the proportion of cases who are treated early; and improving the efficacy of treatment for those with more advanced disease. This amounts to cancer screening (Hill, 1985:38).

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[44] It has been estimated that, in the world as a whole, cigarette smoking is now responsible for more than one million premature deaths each year (Chronic Diseases, 1984, Vol.5(1):1).

Strategies for cancer control should be established both in terms of individual and community. In controlling carcinogenic exposures, however, it should be remembered that these decisions are not so much the prerogative of (social) scientists, but reflect a high proportion of political and governmental influence (Higginson, 1980:463,465).

Although much of chronic mortality appears to be affected by personal decisions and life style, there may be significant chronic morbidity that cannot be altered by personal choice due either by a larger social structure which does not inforce safe environments (e.g., smoking in the workplace), or due to individual genetic predisposition. The vast majority of cancer and heart disease, however, is believed to have been preventable, thus many of these deaths were 'premature' deaths. In fact, of the 10 leading causes of death in the U.S., for instance, at least 7 could have been substantially reduced if persons at risk had improved just 5 habits: diet, smoking, lack of exercise (coupled with overwork), alcohol abuse, and use of antihypertensive medications (Nightingale, 1981:209). Of course, not every sickness, injury or death could have been avoided, but many could have been and can be. It is suggested that increased focus be placed on cancer research and education. Although each type of cancer may be caused by different underlying, intervening or contributing factors, there may be common links in the etiology of the diseases.

Increased research on the biological aging process of degeneration should also prove useful in the understanding of how and why disease appears in an aging individual.

The aging population brings with it a set of specialized needs. It is of vital importance to plan and be prepared for the increasing 'geronto-boom' over the next few decades. One way is to ensure that there are appropriate and effective health resources available. The Canadian Minister of National Health and Welfare, Marc Lelonde, in 1974 divided the main impacts on health into four categories: basic biology, life style, environment, and health care (Nightingale, 1981:209).

With regard to health care services, it is a common observation, supported by empirical research, that the elderly tend to have more illnesses, both physical and mental, and make greater use of health care practitioners and facilities than do younger age groups. In 1971, the population aged 65 and over constituted 8.1 per cent of the Canadian population but accounted for 35% of all patient-days in General and Applied Special Hospitals in Canada (Rombout, 1975:4; Forcese and Richer, 1982:272). The expected rise in Canada's elderly population from 8.1 per cent of the population in 1971 to perhaps 15 per cent of the population in 2001 will generate at least a 30 per cent increase in the demand for hospital care.[45] Accordingly, the increased demand for medical care means an increased demand for care of the chronic diseases, but unfortunately these are the diseases with which the existing health care system is least able to cope due to the existing organization of health care's bias towards treatment of acute conditions with a focus on curative medicine. The result is that an aging population requires not simply a quantitative increase in the supply of medical and health-related facilities, but more importantly, a fundamental qualitative change in the health care industry. As long as the current bias persists, the health care requirement of an aging population will go largely unmet (Forcese and Richer, 1982:273,275).

Priority has been recently oriented towards improving the quality of life rather than simply increasing its duration. 'Life expectancy in good health' would take into consideration various states of health from the most negative (death) to the most positive (total absence of disease and disability) (Peron and Strohmenger, 1985:240). A holistic approach to disease is required and encouraged.

This holistic approach to quality of life includes such things, Penning and Krishnan write, "as family life, living arrangements, opportunities for interaction, employment, recreation, and accessibility of medical and other supportive services. It includes also concerns over euthanasia and the management of death and dying. Finally it incorporates the more general considerations of social values and attributes" (1980:11).

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[45] It is not within the scope of this thesis to specifically discuss the cost-benefit ratio of health.

Merely to keep pace with the anticipated population growth would require redoubled efforts for enlargement of public health facilites and services as well as improvements in their efficiency. Changing attitudes of Canadians towards health care, development of health insurance plans, and changes in patient care practices imply that per capita demands to be made in public health services will be increasingly greater (Kasahara, 1966:56).

Gender

As mentioned earlier in Chapter 6, the increasing sex ratio for women will provide larger numbers of women than men at older ages. This large sex differential in mortality is likely due to two major factors: a decline in immediate, acute causes of death that used to particularly threaten women (like maternal mortality), and an increase in some cause of death particularly threatening to men--perhaps an increase in more hazardous social roles for men. Men's life style behaviours (especially smoking, alcohol consumption, and driving) are less healthful than women's, possibly as a reaction to job stresses. Also, men and women may respond to stress differently and this may influence health. In sum, men apparently experience more health risks from their work activities than do women; their life style behaviours increase the risks of serious chronic conditions; and stress may lead to mortality more readily than for women (Verbrugge, 1983:225).

According to a study by Waldron (1976), three-quarters of excess male mortality in the United States may be explained by causes (heart disease, lung cancer, emphysema, accidents, cirrhosis of the liver, suicide) which are associated with behaviour judged to be more socially acceptable for men (Peron and Strohmenger, 1985:231). The prespects for the future trend of sex differentials in mortality appear to depend largely on developments along two broad fronts: medical technology with respect to the effective treatment of chronic diseases; and prevention through more effective health education and encouragement of changes in personal behaviour and life style (R[illegible]icka and Lopez, 1983:486).

Similarly, the increasing sex role for women present some health care problems as women have more health problems than men in adulthood and old age, and more women than men use health services (Peron and Strohmenger, 1985:143; Angus et al., 1982:40). In addition, it appears that unmet mental health functioning needs increase with age for both males and females, but are generally higher for females (Havens, 1980:220). Since good health is considered to be a highly significant aspect of a good life, females are at a disadvantage compared to males. They simply do not feel as well as often as males (Verbrugge, 1976:401). Facilities, then, for both physical and mental illness will likely be increasingly needed over time due to increasing numbers of women.

Marital Status Differentials

What accounts for the Canadian differentials in mortality in marital status? At least three possible reasons exist: (1) married persons have higher socio-economic status than the non-married; (2) marriage is selective of healthier persons; and/or (3) marriage has a socially integrative function ('protective' factor) (Boyd, 1983:91-92). This thesis supports position three (3), that a protective element of marriage exists, due to the integrative function of marriage. Social participation and close personal relationships, for example, have been found to provide a buffer between a stressful environment and deleterious health consequences (Coburn et al., 1981:448-449).

In Canada in 1971, 62.7 per cent of individuals aged 65 to 69, and 46.5 per cent of individuals over the age of 70 were married. This included 80.4 per cent of males and 55.2 per cent of females from 65 to 69 in addition to 66.6 per cent of males and 31.0 per cent of females over the age of 70. These figures illustrate that the presence or absence of a marital relationship is differentially distributed both by sex and by age (Abu-Laban, 1980; Penning and Krishnan, 1980:11-12). Females, due to their greater longevity and lesser potential for remarriage, are more likely to be and remain widows (Matthews, 19809; Penning and Krishnan, 1980:12). Widows and other older unmarried individuals generally have a great need for supportive networks, as they will be without the support typically provided within the marital relationship. The results of past research show elderly widowed individuals to be over-represented within institutional care facilities, to be less well off financially than their married counterparts, and to experience greater social isolation (Matthews, 1980; Penning and Krishnan, 1980:12).

Facilities for chronically ill, elderly (and especially widowed and unmarried) patients is needed, but perhaps also social workers, counselors and psychiatrists will be needed to deal with depression caused by the social isolation often associated with the unmarried state.

Further to the increasing sex ratio in favour of women, Davis and van den Oever (1982) have a somewhat radical solution to deal with the surplus of elderly, unmarried (widowed) women. They hypothetically suggest implementation of an age-choice rule that men must marry women older than themselves (at least an average of five years older). They believe that this would virtually eliminate all surpluses of unmarried women throughout the age scale. They agree, however, that if age choice were purely habitual or customary, there might be little difficulty in achieving this measure, and if it were purely economic, there would be a tendency for women, as they achieve financial success, to marry men younger than themselves. They also agree that the obstacles of age hypergamy is too universal to be arbitrary, that women of high economic status rarely marry younger men, and that marriage usually involves a sexual attraction (biological component) linked with age--thus, there would be little chance of success with their hypothetical plan (p.505).

It would appear that the problems created by an unbalanced sex ratio and differentially distributed marital relationships will not be readily solved in the near future.

Regional Mortality Differentials

The Prairies have long been thought to be the location of the lowest mortality in Canada, with eastern regions having the highest mortality. This east-west mortality pattern, with the east having higher rates than the west, was occasionally supported in the data, but in most cases, region did not seem to explain any significant amount of variance in general or chronic disease mortality in Canada.

According to the findings in this thesis, the greatest contribution of region is in studying cause of death by age. When age is a conditioning variable, region appears to play a significant role, as it explained up to 24% of extra variance in the regression equation (age 35-44 for cancer mortality variation) in Hypothesis 8.

As indicated by the recursive path diagrams in this chapter, however, region appeared to have little association with any of the variables, and its regression slope was almost non-existent. Thus, it is suggested that region may not make a suitable predictor variable with regard to general mortality, or for aggregated groupings of chronic disease mortality.

Time Effects

Longitudinal and period studies are vital in helping to contribute to the understanding of why and how mortality occurs. A definite time interaction with mortality was observed in the data (e.g.. declining cardiovascular disease over time, and increasing malignant neoplasm mortality over time). Further mortality studies should consider the effect of time in the data.

D. Future Studies

A great many areas of research still need to be explored with regard to mortality; just a few are listed below, under specific concerns.

Age

The mortality and morbidity patterns of increasing age are still largely an unexplored area. For example, it is believed that the health of the age group 65 to 74 differs significantly from that of the 75+ group as biological declines in function do not become marked until after age 75 (Atchley, 1980:130-131). The aged population is not a homogeneous group but rather consists of several chronologically defined groups: the young-old, the middle-old and the old-old.[44] These groups are distinct not only in terms of age but also in terms of health, housing needs and living arrangements (Forcese and Richer, 1982:266).

In terms of health, for instance, gains in level of basic primary health care seem to improve mortality patterns of the elderly except at ages 75-84 at which point no real benefit is discerned (Weatherby, 1983:126).

Weatherby further states that "because of reductions in mortality at the beginning of the older aged, the demand for services designed to assist persons under the age of 75 is increasing more than is the demand for programs designed for persons who are ages 75 and above. As more persons survive to ages 75 and above, what types of services will be required?" (pp.131-132). He suggests efforts should be made to study the entire age range. Serious consideration must be given for appropriate ages for delineating age sub-categories, especially in an historical and/or longitudinal study (Havens, 1980:221).

Lastly, the study of the mortality experience of age cohorts is encouraged as a valuable addition and comparison to the information gathered by periodic studies.

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[44] Betty Havens (1980) cautions, however, that when the data are sub-categorized by age only, the sex distinction disappears. She warns the researcher that age-category analyses should be expanded to age/sex category analyses (p.221)

Chronic Disease

Continued research on chronic disease could take a number of different directions. Some of these could be: projecting more complete estimates of chronic disease prevalence; developing models to determine how the demand for health services is likely to change; more inclusive research on chronic disease etiology and pathogenesis; and more validation of concepts and hypotheses where controversy exists (Levy, 1981:68). Ways must also be determined to help promote positive behavioural change with regard to chronic disease. Epidemiological studies can help to point the way to prevention, as well as indicate the economic advantages to be gained from preventive programmes in the area of chronic disease and trauma (Smith, 1976:87).

Future Cancer Research. The different types of cancers should be studied separately as the etiology of individual cancer sites is different. The aggregation of all cancer sites not only dilutes the increasing mortality trend of lung cancer, but also masks the decreasing trends in other sites (Mao and Smith, 1982:19).

Secondly, Canada is one of the few countries in which the entire population is covered by cancer registration (the NCIRS, or National Cancer Incidence Reporting System) with a centralized data system maintained at Statistics Canada (Malhotra, 1986:73). It is suggested that greater use by made of these facilities.

Thirdly, further research is needed in the area of smoking cessation in all levels of society. The low socioeconomic status groups, for instance, have not yet shown population trends towards reduced smoking. Preventive strategies that include effective measures to reduce tobacco consumption are urgently required.

Cardiovascular Disease Research. A reductionist model ultimately seeks to establish etiology at the molecular, biological level. Such a model could be developed for either cancer or cardiovascular disease. A description of social and cultural factors related to coronary heart disease, for instance, might lead to the investigation of certain personality characteristics and this in turn, might lead to a better understanding of metabolic and physiologic defects which might help in the understanding of the disease (Syme, 1967:178).

Ultimately, a model that states how changes in chronic disease incidence and prevalence affect death rates is desired. To craft a model linking morbidity and mortality is difficult but not impossible. With a model, scientists could interpret recent trends and make future forecasts about morbidity and mortality with more confidence and rigor than is now possible (Verbrugge, 1984:513).

It is not known to what extent such behaviours as exercise, dietary patterns, caffeine intake, alcohol use, smoking, use of preventive health measures such as medical examinations, dental use, adequate personal health habits, seat belt use, and various kinds of risk behaviours involving automobiles, drugs or suicide, are related or are quite separate phenomena. Further research into these topics is necessary (Coburn et al., 1981:450).

Also, with a number of developed countries achieving Omran's final societal state, and with mortality patterns of cardiovascular disease continuing to decline and change, there is a critical need for a new, expanded theoretical perspective to explain the continuing chronic disease changes (Manton, 1984:261).

Gender

The social experience of being elderly differs greatly for men and women and needs to be further explored.

Sex mortality differentials still predominate in favour for the woman though the differences appear to be largely decreasing. Research activities should be undertaken to help define the association between the biological, environmental, life style, economic, and cultural determinants of sex morbidity and sex mortality differentials.

With regard to sex mortality and morbidity differential behavioural factors, research on the following topics is recommended by Ruzicka and Lopez (1983):

1. differences between men and women in the perception of symptoms, evaluations of symptom severity, and predisposition for curative and

preventive health care;

2. differential health socialization of boys and girls;

3. ways in which men and women respond to emotional stress, especially those which have negative consequences for their physical health (such as smoking, alcohol abuse, etc.); and

4. men's and women's acceptance of programmes to alter their life style behaviour, and compliance with these programmes (p.491).

Marital Status

Further research is needed for the 'protection/selection' argument of marriage with regard to mortality.

Regional

Mortality as related to provincial and urban-rural differences needs to be studied, to determine if greater breakdown of region will provide more support for a regional mortality effect.

Other Factors

Other variables may play a significant part in mortality which were not individually studied in this thesis. These include: race, socioeconomic status, education, occupation, income, ethnic origin, and seasonal variation of disease and mortality, as well as the influence of economic changes in society, and unemployment on mortality.

Mortality data "are only the tips of icebergs representing disease, disability and the destruction of the quality as well as the quantity of life" (Coburn and Baker, 1974:680). So much must still be inferred from the data, due to lack of explicit behavioural pattern linkage to mortality.

Human behaviour must be considered within an ecological framework rather than in isolation. There are social, cultural and physical environmental factors that help determine whether individuals eat or drink too much, smoke, or are physically inactive. As Colburn and Baker also write, "We so often do not die--we kill ourselves" (1974:680). They suggest that the responsibility for prevention rests more with the individual and society at large than with the health worker.

It is believed that more positive benefits will derive from social change rather than with medical changes, as more medicine does not necessarily equate with more health. McKeown has written extensively in this vein and has concluded that "past improvement has been mainly due to modification of behaviour and changes in the environment and it is to these same influences that we must look particularly for further advance" (McKeown, 1971; Colburn and Baker, 1974:680).

Improved health care may result in a long-term increase in the prevalence of chronic conditions because of earlier diagnosis and the consequent prolongation of life (Newman and Anderson, 1974:212), although it will be partially offset by the trend toward better health among elders. There will always be a disease pattern of some kind; at least we can hope to minimize disease and deaths in Canada by working towards eliminating preventable causes of death in the future.

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APPENDIX A

TABLE A-1

Regression of the Ratio of Cardiovascular Disease Death Rate to the General Death Rate, on Sex, Time and Region, Conditioning for Selected Ages, Canada

	35-44				45-54				(35-54)			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	-.43	-10.260**	-.43	-6.15	-.66	-15.754**	-.66	-11.09	-.50	-13.044**	-.51	-10.62
Y1(1961)	.11	-1.170	-.04	-.49	.05	-.173	-.01	-.09	.07	-.745	-.03	-.43
Y2(1971)	-.11	-5.660*	-.21	-2.39	-.01	-1.527	-.06	-.76	-.06	-3.667*	-.12	-2.11
Y3(1981)	-.16	-6.779**	-.25	-2.86	-.10	-3.271	-.12	-1.63	-.12	-5.099**	-.17	-2.93
R1(Atlantic)'''	-.04	.601	.02	.23	.02	1.217	.04	.54	-.00	1.001	.03	.51
R2(Quebec)	.07	2.773	.09	1.06	-.02	.362	.01	.16	.02	1.567	.05	.81
R3(Ontario)	.12	4.078	.14	1.55	.12	3.668	.12	1.63	.11	3.873*	.12	2.00
R4(BC)	-.11	-1.307	-.04	-.50	-.10	-1.688	-.06	-.75	-.10	-1.498	-.05	-.77
a	--	23.798**	--	9.49	--	34.654**	--	16.26	--	29.300**	--	15.89
$\overline{X}$			16.45				26.25				21.36	
S.D.			11.98				12.00				12.94	
R^2			.27				.47				.30	
R^2adj.			.23				.44				.28	
N			159				160				319	

*p≤.05

**p≤.01

'''R1(Atlantic)= a dummy variable for region: 0=Prairies, 1=Atlantic. R2(Quebec): 0=Prairies, 1=Quebec. R3(Ontario): 0=Prairies, 1=Ontario. R4(BC): 0=Prairies, 1=British Columbia. For a definition of other statistics used, see Table 5-1.

TABLE A-2

Regression of the Ratio of Malignant Neoplasm Mortality Rate to the General Death Rate, on Sex and Time, Conditioning for Selected Ages, Canada

	35-44				45-54				(35-54)			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	.62	17.874**	.62	9.96	.72	20.498**	.72	13.93	.65	19.265**	.65	15.46
Y1(61)	-.00	1.988	.06	.77	.05	5.135*	.16	2.46	.03	3.666*	.11	2.06
Y2(71)	-.03	.856	.03	.34	-.02	3.433	.11	1.64	-.02	2.117	.06	1.20
Y3(81)	.11	4.310	.13	1.70	.14	7.282**	.22	3.49	.12	5.768**	.17	3.27
R1(Atlantic)	.10	5.556	.15	1.94	.00	-.194	-.01	-.08	.05	2.669	.07	1.35
R2(Quebec)	.07	4.123	.11	1.45	.17	4.926*	.14	2.11	.11	4.420*	.12	2.24
R3(Ontario)	.05	3.429	.10	1.22	-.05	-1.645	-.05	-.71	.00	.788	.02	.40
R4(BC)	-.14	-2.071	-.06	-.73	-.14	-4.298	-.12	-1.85	-.14	-3.289	-.09	-1.68
a	--	7.781**	--	2.91	--	14.926**	--	6.77	--	11.406**	--	6.13
$\overline{X}$			20.46				28.82				24.68	
S.D.			14.48				14.27				14.95	
R^2			.43				.60				.47	
R^2adj.			.40				.58				.45	
N			156				159				315	

*p≤.05
**p≤.01

For a definition of statistics used, see Tables 5-1 and A-1.

TABLE A-3

Regression of the Ratio of Chronic''' Mortality Rate to the General Death Rate, on Sex and Time, Conditioning for Selected Ages, Canada

	35-44				45-54				(35-54)			
	r	b	B	t	r	b	B	t	r	b	B	t
S1(F)	.13	3.626*	.14	2.43	.09	2.304	.09	1.56	.11	2.992**	.11	2.71
Y1(61)	.05	.454	.02	.21	.05	2.617	.09	1.25	.05	1.552	.05	.99
Y2(71)	-.06	-2.124	-.07	-1.00	-.02	1.088	.04	.52	-.04	-.558	-.02	-.36
Y3(81)	-.01	-.956	-.03	-.45	.03	2.141	.07	1.03	.01	.552	.02	.35
R1(Atlantic)	.04	2.798	.08	1.18	.01	.511	.02	.22	.03	1.696	.05	.97
R2(Quebec)	.07	3.462	.10	1.47	.09	2.474	.08	1.06	.07	2.929	.08	1.67
R3(Ontario)	.08	3.878	.12	1.65	.03	1.011	.03	.43	.05	2.405	.07	1.38
R4(BC)	-.12	-1.565	-.05	-.67	-.12	-2.993	-.09	-1.29	-.12	-2.318	-.07	-1.33
a	--	15.606**	--	6.98	--	24.722**	--	11.18	--	20.206**	--	12.20
$\overline{X}$			18.44				27.53				23.01	
S.D.			13.41				13.22				14.06	
R'			.05				.03				.03	
R'adj.			.02				.01				.02	
N			315				319				634	

*p≤.05
**p≤.01
'''Cardiovascular disease mortality and malignant neoplasm mortality together.

For a definition of statistics used, see Tables 5-1 and A-1.

TABLE A-4

Regression of the Logarithm of the General Death Rate on Age and Time, Conditioning for Sex, Canada'''

	MALES				FEMALES			
	r	b	B	t	r	b	B	t
Y1(1961)	-.01	-.044**	-.02	-4.86	.01	-.173**	-.06	-16.29
Y2(1971)	.01	-.011	-.01	-1.22	-.01	-.243**	-.09	-23.59
Y3(1981)	-.01	-.108**	-.05	-12.36	-.03	-.367**	-.14	-36.43
A1(35-44)	-.66	-2.610**	-.92	-275.63	-.60	-2.916**	-.81	-254.33
A2(45-54)	-.37	-1.723**	-.70	-205.72	-.43	-2.132**	-.68	-212.80
A3(55-64)	.06	-.889**	-.39	-114.91	-.14	-1.316**	-.47	-146.85
R1(Atlantic)	.01	.072**	.03	6.76	.02	.100**	.03	8.01
R2(Quebec)	-.00	.143**	.06	15.17	-.00	.128**	.05	11.60
R3(Ontario)	.01	.110**	.05	12.09	.02	.091**	.04	8.56
R4(BC)	.01	.080**	.03	7.73	-.01	.043**	.01	3.50
a	--	3.847**	--	390.96	--	3.766**	--	328.62
$\ln(\overline{X})$			2.90				2.63	
ln(S.D.)			1.01				1.17	
R'			.84				.85	
R'adj.			.84				.85	
N			16,913				16,786	

*p≤.05 ; **p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

TABLE A-5

Regression of the Logarithm of the General Death Rate on Age and Region, and Conditioning by Year and Sex'''

	MALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
A1	-.69	-2.513**	-.95	-142.70	-.68	-2.673**	-.94	-155.35	-.66	-2.600**	-.92	-144.27	-.64	-2.642**	-.87	-125.96
A2	-.37	-1.649**	-.70	-103.80	-.38	-1.759**	-.71	-115.47	-.37	-1.709**	-.71	-107.97	-.38	-1.764**	-.68	-95.99
A3	.11	-.794**	-.37	-54.06	.08	-.899**	-.40	-63.25	.07	-.899**	-.40	-61.10	.02	-.945**	-.40	-56.48
R1	-.02	.064**	.02	3.25	-.00	.114**	.04	5.88	.02	.093**	.03	4.60	.02	.025	.01	1.04
R2	-.01	.206**	.09	11.59	-.02	.176**	.07	10.15	.02	.173**	.07	9.65	.00	.036	.02	1.77
R3	.01	.164**	.08	9.63	.03	.213**	.09	12.89	.00	.102**	.05	5.87	-.01	-.014	-.01	-.68
R4	.04	.171**	.07	8.80	.03	.155**	.06	8.16	-.01	.089**	.03	4.50	-.01	-.061**	-.02	-2.71
a	--	3.747**	--	252.68	--	3.768**	--	259.45	--	3.825**	--	251.27	--	3.855**	--	222.04
$\ln(\overline{X})$			2.91				2.88				2.92				2.88	
ln(SD)			.97				1.02				1.00				1.05	
R'			.87				.88				.85				.80	
R'adj.			.87				.88				.85				.80	
N			3,696				3,963				4,429				4,825	

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1, 5-8 and A-1.

TABLE A-6

Regression of the Logarithm on the General Death Rate on Age and Region, Conditioning by Year and Sex'''

	FEMALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
A1	-.63	-2.800**	-.87	-136.16	-.62	-3.052**	-.83	-139.02	-.57	-2.845**	-.78	-121.23	-.59	-2.966**	-.76	-123.72
A2	-.42	-2.058**	-.71	-109.78	-.43	-2.184**	-.69	-114.50	-.45	-2.141**	-.69	-105.78	-.44	-2.134**	-.65	-103.95
A3	-.06	-1.191**	-.46	-70.07	-.13	-1.361**	-.47	-77.89	-.17	-1.344**	-.48	-74.18	-.20	-1.348**	-.47	-75.74
R1	.02	.134**	.04	5.77	.01	.161**	.05	6.69	.01	.088**	.03	3.44	.02	.040	.01	1.59
R2	.00	.229**	.09	10.86	.01	.211**	.08	9.90	.00	.124**	.05	5.57	-.02	-.006	-.00	-.30
R3	.02	.108**	.04	5.35	.01	.140**	.05	6.81	.01	.075**	.03	3.48	.02	.055**	.02	2.63
R4	-.00	.031	.01	1.33	-.01	.066**	.02	2.76	.00	.086**	.03	3.49	-.01	-.006	-.00	-.26
a	--	3.673**	--	209.47	--	3.582**	--	204.48	--	3.522**	--	192.56	--	3.469**	--	196.23
$\ln(\overline{X})$			2.72				2.64				2.62				2.57	
ln(SD)			1.12				1.20				1.16				1.17	
R'			.87				.88				.83				.82	
R'adj.			.87				.88				.83				.82	
N			3,537				3,865				4,427				4,957	

$^{*}p \leq .05$
$^{**}p \leq .01$

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1, 5-8 and A-1.

TABLE A-7

Regression of the Ratio of Female to Male General Death Rates(1) on Time, Controlling for Marital Status and Conditioning on Age, Regions of Canada

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.14	-12.112*	-.30	-2.46	.09	-3.914	-.13	-1.27	.07	-6.498*	-.23	-2.14
Y2(71)	.05	-6.824	-.16	-1.37	-.20	-10.708**	-.35	-3.48	-.22	-12.425**	-.44	-4.08
Y3(81)	-.17	-12.810**	-.32	-2.64	-.16	-9.643**	-.31	-3.14	-.22	-12.530**	-.45	-4.12
M1(S)	-.09	-16.114**	-.40	-3.32	-.10	-16.244**	-.53	-5.28	-.01	-8.188**	-.29	-2.69
M2(W)	.01	-13.480**	-.32	-2.70	-.07	-15.484**	-.50	-5.04	-.02	-8.268**	-.29	-2.72
M3(D)	-.37	-24.522**	-.60	-4.98	-.43	-23.651**	-.77	-7.69	-.35	-15.266**	-.54	-5.02
R1(A)	.05	.545	.01	.10	.06	.820	.03	.24	.25	5.739	.19	1.69
R2(Q)	-.01	-.830	-.02	-.15	-.07	-2.613	-.08	-.76	-.19	-4.975	-.16	-1.46
R3(O)	.02	.044	.00	.01	-.07	-2.714	-.08	-.79	-.08	-2.203	-.07	-.65
R4(BC)	-.08	-3.443	-.08	-.61	.06	.723	.02	.21	.00	-.322	-.01	-.10
a	--	76.036**	--	13.22	--	68.305**	--	18.95	--	63.344**	--	17.76
$\bar{X}$			54.01				47.64				47.20	
S.D.			17.74				13.39				12.24	
R^2			.35				.54				.46	
R^2adj.			.25				.47				.38	
N			77				80				80	

TABLE A-7
(Continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.22	-1.361	-.04	-.39	.11	-10.823**	-.34	-3.82
Y2(71)	-.19	-11.420**	-.34	-3.23	-.30	-19.369**	-.63	-7.05
Y3(81)	-.30	-14.247**	-.43	-4.03	-.37	-21.014**	-.69	-7.65
M1(S)	-.05	-12.518**	-.38	-3.59	.23	3.598	.12	1.31
M2(W)	.01	-11.206**	-.34	-3.21	.06	-.337	-.01	-.12
M3(D)	-.42	-21.664**	-.64	-6.12	-.38	-10.683**	-.34	-3.77
R1(A)	.10	-.071	-.00	-.02	.20	7.822*	.23	2.47
R2(Q)	-.00	-2.928	-.08	-.75	.12	5.997	.18	1.92
R3(O)	-.06	-4.471	-.12	-1.15	-.07	.972	.03	.31
R4(BC)	-.14	-6.693	-.19	-1.72	-.17	-1.625	-.05	-.52
a	--	69.601**	--	16.97	--	74.873**	--	23.05
$\overline{X}$			48.68				62.99	
S.D.			14.58				13.42	
R^2			.50				.64	
R^2adj.			.43				.58	
N			79				78	

*p≤.05. **p≤.01

TABLE A-7
(continued)

[illegible]Ratio: Female general death rates, by age group and year/male general death rates, by age group and year X 100.

For a definition of statistics used, see Tables A-1 and 5-1.

TABLE A-8

Regression of the Ratio of Female to Male General Death Rates'' on Time, Controlling for Marital Status and Conditioning on Age, by Region

	ATLANTIC REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.27	-32.818**	-.66	-3.27	.28	-.850	-.03	-.12	.12	-10.289	-.41	-1.96
Y2(71)	.07	-25.876*	-.47	-2.33	-.40	-17.302*	-.54	-2.43	-.52	-22.295**	-.90	-4.25
Y3(81)	-.43	-38.570**	-.78	-3.84	-.19	-12.180	-.38	-1.71	-.27	-17.497**	-.70	-3.34
M1(S)	-.20	-19.932	-.40	-1.98	.12	-9.764	-.30	-1.37	.24	1.453	.06	.28
M2(W)	.24	-3.691	-.07	-.37	-.17	-16.789*	-.52	-2.35	-.12	-5.192	-.21	-.99
M3(D)	-.42	-31.525*	-.57	-2.84	-.49	-24.489**	-.76	-3.43	-.28	-8.122	-.33	-1.55
a	--	92.590**	--	9.77	--	69.557**	--	10.43	--	68.775**	--	14.02
$\bar{X}$			55.77				49.21				53.29	
S.D.			22.79				14.36				11.14	
R'			.78				.70				.73	
R'adj.			.61				.51				.56	
N			15				16				16	

TABLE A-8
(Continued)

	ATLANTIC REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.27	-11.724*	-.34	-2.32	.23	-9.511*	-.32	-2.87
Y2(71)	-.37	-27.815**	-.80	-5.51	-.29	-19.908**	-.74	-6.63
Y3(81)	-.52	-31.769**	-.92	-6.29	-.64	-26.685**	-.99	-8.89
M1(S)	.06	-9.420	-.27	-2.06	.39	11.211**	.42	3.74
M2(W)	-.10	-13.433*	-.39	-2.94	-.05	2.553	.10	.85
M3(D)	-.42	-17.810**	-.47	-3.53	-.17	1.040	.04	.31
a	--	80.335**	--	17.58	--	78.944**	--	27.90
$\bar{X}$			51.66				68.50	
S.D.			15.84				12.25	
R^2			.91				.93	
R^2adj.			.83				.88	
N			15				15	

*p≤.05
**p≤.01

(1)Ratio: Female general death rates, by age group and year/male general death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-9

Regression of the Ratio of Female to Male General Death Rates(1) on Time, Controlling for Marital Status and Conditioning on Age, by Region

	QUEBEC REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	.00	-10.051	-.27	-1.08	.27	1.108	.03	.12	.26	4.520	.12	.48
Y2(71)	.18	-5.232	-.14	-.56	-.27	-12.601	-.37	-1.33	-.21	-8.614	-.23	-.92
Y3(81)	-.54	-25.070*	-.68	-2.68	-.22	-11.169	-.33	-1.18	-.15	-6.874	-.18	-.73
M1(S)	-.23	-21.029*	-.57	-2.25	-.19	-18.268	-.54	-1.93	-.05	-15.975	-.42	-1.70
M2(W)	-.15	-18.618	-.50	-1.99	.02	-12.959	-.38	-1.37	.16	-10.144	-.27	-1.08
M3(D)	-.15	-18.670	-.50	-2.00	-.37	-22.900*	-.68	-2.42	-.63	-32.554**	-.86	-3.47
a	--	78.407**	--	8.97	--	64.979**	--	7.34	--	59.986**	--	6.83
$\overline{X}$			53.74				45.78				42.58	
S.D.			16.57				15.08				16.86	
R^2			.62				.53				.63	
R^2adj.			.36				.21				.38	
N			16				16				16	

TABLE A-9
(Continued)

	QUEBEC REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.35	8.261	.19	.64	-.15	23.877*	-.61	-2.43
Y2(71)	-.19	-9.382	-.22	-.73	-.27	-27.354*	-.70	-2.78
Y3(81)	-.26	-11.596	-.27	-.90	-.24	-26.301*	-.67	-2.67
M1(S)	-.15	-19.205	-.45	-1.49	.06	-7.558	-.19	-.77
M2(W)	.10	-11.000	-.26	-.85	-.00	-9.305	-.24	-.95
M3(D)	-.39	-26.850	-.62	-2.08	-.37	-20.133	-.51	-2.05
a	--	66.013**	--	5.46	--	94.845**	--	10.30
$\overline{X}$			48.57				66.21	
S.D.			19.31				17.52	
R²			.46				.62	
R²adj.			.11				.37	
N			16				16	

*p≤.05
**p≤.01
'¹'Ratio: Female general death rates, by age group and year/male general death rates, by age group and year X 100.

For a definition of statistics used, see Tables 5-1 and 5-8.

TABLE A-10

Regression of the Ratio of Female to Male General Death Rates''' on Time, Controlling for Marital Status and Conditioning on Age, by Region.

	ONTARIO REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.36	-12.322	-.41	-1.55	.08	-1.503	-.07	-.35	-.19	-13.261**	-.72	-3.83
Y2(71)	.27	1.823	.06	.23	-.13	-5.147	-.22	-1.21	-.34	-15.331**	-.83	-4.43
Y3(81)	-.09	-6.272	-.21	-.79	-.11	-4.697	-.20	-1.10	-.24	-13.910**	-.75	-4.02
M1(S)	-.06	-15.379	-.51	-1.94	-.20	-16.226**	-.70	-3.81	-.19	-8.819*	-.48	-2.55
M2(W)	-.29	-20.447*	-.68	-2.58	.12	-10.716*	-.46	-2.51	-.14	-8.186*	-.44	-2.37
M3(D)	-.26	-19.909*	-.66	-2.51	-.65	-24.045**	-1.03	-5.64	-.11	-7.733*	-.42	-2.24
a	--	72.741**	--	9.79	--	61.264**	--	15.37	--	62.158**	--	19.21
$\overline{X}$			54.62				45.68				45.35	
S.D.			13.49				10.42				8.30	
R'			.58				.80				.79	
R'adj.			.31				.67				.65	
N			16				16				16	

TABLE A-10
(Continued)

	ONTARIO REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.06	-9.424*	-.42	-2.68	.31	-4.557	-.16	-1.27
Y2(71)	-.32	-15.815**	-.71	-4.50	-.50	-21.442**	-.77	-5.98
Y3(81)	-.35	-16.255**	-.73	-4.63	-.34	-18.185**	-.65	-5.07
M1(S)	-.05	-10.018*	-.45	-2.85	.44	9.268*	.33	2.59
M2(W)	-.03	-9.608*	-.43	-2.73	.08	1.549	.06	.43
M3(D)	-.47	-17.049**	-.76	-4.85	-.52	-10.945**	-.39	-3.05
a	--	66.569**	--	20.25	--	72.267**	--	21.55
$\overline{X}$			47.03				61.19	
S.D.			10.01				12.53	
R^2			.85				.90	
R^2adj.			.75				.84	
N			16				16	

*p≤.05
**p≤.01

'''Ratio: Female general death rates, by age group and year/male general death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-11

Regression of the Ratio of Female to Male General Death Rates''' on Time, Controlling for Marital Status and Conditioning on Age, by Region.

	PRAIRIES REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.19	-18.762	-.39	-1.26	.09	-5.877	-.17	-.64	.15	-4.454	-.16	-.67
Y2(71)	-.14	-12.602	-.29	-.93	-.08	-10.289	-.31	-1.13	-.14	-10.393	-.37	-1.56
Y3(81)	.05	-6.726	-.16	-.50	-.33	-16.637	-.49	-1.82	-.37	-15.312*	-.55	-2.30
M1(S)	.31	-1.219	-.03	-.09	.12	-10.280	-.31	-1.13	.18	-4.200	-.15	-.63
M2(W)	-.22	-22.282	-.47	-1.49	-.30	-20.969*	-.62	-2.30	.07	-6.520	-.23	-.98
M3(D)	-.46	-25.493	-.59	-1.89	-.36	-22.365*	-.66	-2.45	-.63	-21.231**	-.76	-3.18
a	--	75.332**	--	5.91	--	69.999**	--	8.19	--	63.078**	--	10.11
$\bar{X}$			54.85				48.39				47.55	
S.D.			19.80				15.06				12.55	
R'			.47				.56				.66	
R'adj.			.07				.26				.44	
N			15				16				16	

TABLE A-11
(Continued)

	PRAIRIES REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.30	2.844	.09	.31	.10	-13.529*	-.46	-2.38
Y2(71)	-.10	-6.400	-.21	-.70	-.13	-15.749*	-.59	-3.06
Y3(81)	-.37	-12.579	-.41	-1.37	-.65	-26.011**	-.98	-5.06
M1(S)	.09	-6.753	-.22	-.74	.07	-.645	-.02	-.13
M2(W)	-.02	-9.089	-.30	-.99	.15	.832	.03	.16
M3(D)	-.45	-19.094	-.62	-2.08	-.36	-10.329	-.35	-1.82
a	--	64.265**	--	7.49	--	76.531**	--	15.79
$\overline{X}$			51.50				60.67	
S.D.			13.75				12.15	
R^2			.47				.80	
R^2adj.			.11				.64	
N			16				15	

*p≤.05
**p≤.01

'''Ratio: Female general death rates, by age group and year/male general death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-12

Regression of the Ratio of Female to Male General Death Rates(1) on Time, Controlling for Marital Status and Conditioning on Age, by Region.

	BRITISH COLUMBIA REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	.10	9.353	.25	1.00	-.30	-12.447*	-.44	-2.95	-.20	-9.006	-.43	-1.46
Y2(71)	-.07	7.760	.19	.75	-.10	-8.199	-.29	-1.94	.03	-5.491	-.26	-.89
Y3(81)	.21	12.590	.34	1.35	.12	-3.531	-.12	-.84	-.20	-9.059	-.43	-1.47
M1(S)	-.30	-23.013*	-.62	-2.46	-.46	-26.682**	-.94	-6.33	-.35	-13.398	-.64	-2.17
M2(W)	.33	-3.902	-.09	-.38	.04	-15.987**	-.56	-3.79	-.22	-11.298	-.54	-1.83
M3(D)	-.54	-29.523**	-.79	-3.16	-.36	-24.458**	-.86	-5.80	.07	-6.689	-.32	-1.08
a	--	58.437**	--	6.62	--	71.943**	--	18.24	--	60.964**	--	10.55
$\overline{X}$			51.05				49.12				47.23	
S.D.			17.12				12.73				9.41	
R²			.66				.87				.48	
R²adj.			.40				.78				.14	
N			15				16				16	

TABLE A-12
(Continued)

	BRITISH COLUMBIA REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.03	-.426	-.01	-.05	.27	-.494	-.02	-.09
Y2(71)	-.01	-1.351	-.05	-.16	-.41	-12.391	-.53	-2.13
Y3(81)	-.07	-2.700	-.09	-.31	-.15	-7.886	-.33	-1.35
M1(S)	-.17	-17.193	-.58	-1.97	.36	5.714	.24	.98
M2(W)	.03	-12.901	-.44	-1.48	.19	2.683	.11	.46
M3(D)	-.47	-23.852*	-.81	-2.73	-.58	-10.901	-.46	-1.87
a	--	59.410**	--	7.28	--	64.410**	--	11.82
$\overline{X}$			44.80				58.59	
S.D.			13.17				10.56	
R^2			.47				.64	
R^2adj.			.12				.39	
N			16				16	

*p≤.05

**p≤.01

(1)Ratio: female general death rates, by age group and year/male general death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-13

Regression of the Logarithm of the Cardiovascular Disease Death Rate on Age and Time and Region, Conditioning for Sex, Canada'''

	MALES				FEMALES			
	r	b	B	t	r	b	B	t
Y1(1961)	.03	.034**	.01	3.28	.04	-.162**	-.05	-10.01
Y2(1971)	.01	-.030**	-.01	-2.94	-.01	-.378**	-.11	-23.69
Y3(1981)	-.06	-.222**	-.08	-21.66	-.07	-.561**	-.17	-35.68
A1(35-44)	-.65	-3.448**	-.81	-262.94	-.56	-4.224**	-.69	-181.52
A2(45-54)	-.44	-2.117**	-.65	-207.15	-.49	-3.006**	-.65	-168.52
A3(55-64)	-.12	-1.162**	-.41	-129.74	-.27	-1.782**	-.48	-124.19
R1(Atlantic)	.01	.102**	.03	8.14	.02	.212**	.05	10.75
R2(Quebec)	-.01	.173**	.06	15.61	-.00	.251**	.07	14.34
R3(Ontario)	.03	.209**	.08	19.73	.04	.235**	.07	13.94
R4(BC)	-.00	.037**	.01	3.01	-.01	.111**	.03	5.65
a	--	3.230**	--	292.76	--	2.955**	--	168.97
$\ln(\overline{X})$			2.39				1.89	
ln(S.D.)			1.19				1.48	
R^2			.87				.85	
R^2adj.			.87				.85	
N			14,108				10,738	

*p≤.05, **p≤.01 '''The equation is weighted. For weight formula, see Table 5-1.

TABLE A-14

Regression of the Logarithm of the Malignant Neoplasm Death Rate on Age and Time and Region, Conditioning for Sex, Canada'''

	MALES				FEMALES			
	r	b	B	t	r	b	B	t
Y1(1961)	-.03	.120**	.05	11.76	-.03	-.070**	-.03	-7.78
Y2(1971)	.03	.234**	.09	23.55	.00	-.064**	-.03	-7.38
Y3(1981)	.08	.299**	.12	30.98	.03	-.066**	-.04	-7.84
A1(35-44)	-.68	-3.269**	-.82	-264.29	-.71	-2.441**	-.88	-248.10
A2(45-54)	-.46	-2.018**	-.66	-207.30	-.40	-1.432**	-.63	-174.56
A3(55-64)	-.08	-.972**	-.37	-116.64	-.03	-.732**	-.40	-98.53
R1(Atlantic)	-.01	.093**	.03	7.95	.01	.082**	.03	7.85
R2(Quebec)	.05	.249**	.10	24.18	.05	.171**	.09	18.75
R3(Ontario)	-.00	.114**	.05	11.42	-.01	.068**	.04	7.66
R4(BC)	-.01	.038**	.01	3.29	-.01	.030**	.01	2.93
a	--	2.234**	--	210.53	--	2.000**	--	208.19
$\ln(\overline{X})$			1.71				1.34	
ln(S.D.)			1.11				.87	
R^2			.90				.88	
R^2adj.			.90				.88	
N			10,678				10,304	

*p≤.05, **p≤.01 '''The equation is weighted. For weight formula, see Table 5-1.

TABLE A-15

Regression of the Logarithm of the Cardiovascular Death Rate on Age and Region, Conditioning on Sex and Year, Canada'''

	MALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
A1	-.67	-3.316**	-.83	-125.74	-.66	-3.390**	-.83	-144.28	-.66	-3.527**	-.82	-136.55	-.64	-3.552**	-.79	-128.41
A2	-.44	-2.071**	-.65	-97.60	-.45	-2.121**	-.66	-113.59	-.44	-2.108**	-.65	-107.53	-.44	-2.162**	-.64	-102.40
A3	-.08	-1.062**	-.39	-57.63	-.11	-1.166**	-.41	-70.19	-.11	-1.159**	-.41	-67.16	-.16	-1.246**	-.43	-68.16
R1	-.03	-.042	-.01	-1.61	-.01	.132**	.04	5.74	.02	.198**	.06	8.17	.04	.096**	.03	3.79
R2	-.02	.169**	.06	7.42	-.01	.242**	.09	11.82	.01	.261**	.09	12.15	-.03	.028	.01	1.24
R3	.05	.250**	.10	11.56	.05	.326**	.12	16.68	.02	.219**	.08	10.59	.02	.059**	.02	2.70
R4	.03	.105**	.03	4.19	.02	.163**	.05	7.19	-.02	.044	.01	1.83	-.03	-.139**	-.04	-5.56
a	--	3.185**	--	177.06	--	3.187**	--	196.37	--	3.165**	--	183.30	--	3.146**	--	175.63
$\ln(\overline{X})$			2.42				2.46				2.41				2.27	
ln(SD)			1.16				1.19				1.20				1.21	
R²			.87				.89				.88				.86	
R²adj.			.87				.89				.88				.86	
N			3,135				3,473				3,686				3,815	

*p≤.05
**p≤.01

'''Regression equation is weighted. For formula, see Table 5-1.
For a definition of statistics used, see Tables 5-8 and A-1.

TABLE A-16

Regression of the Logarithm of the Cardiovascular Death Rate on
Age and Region, Conditioning on Sex and Year, Canada''

	FEMALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
A1	-.60	-3.723**	-.75	-101.36	-.59	-4.315**	-.71	-100.04	-.55	-4.456**	-.66	-86.79	-.56	-4.523**	-.66	-86.43
A2	-.49	-2.785**	-.67	-88.96	-.51	-3.000**	-.66	-92.51	-.51	-3.113**	-.65	-84.04	-.49	-3.098**	-.62	-80.74
A3	-.20	-1.532**	-.45	-59.84	-.26	-1.753**	-.47	-65.47	-.30	-1.893**	-.49	-63.97	-.32	-1.917**	-.49	-64.25
R1	-.01	.092**	.02	2.59	.00	.219**	.05	5.90	.02	.266**	.06	6.51	.04	.268**	.06	6.63
R2	-.00	.238**	.07	7.44	.01	.344**	.10	10.52	.00	.294**	.08	8.20	-.02	.142**	.04	3.98
R3	.05	.248**	.08	8.14	.04	.312**	.10	9.92	.03	.212**	.06	6.08	.03	.180**	.05	5.20
R4	-.00	.130**	.03	3.62	-.01	.215**	.05	5.85	-.02	.091*	.02	2.25	-.03	.028	.01	.69
a	--	2.846**	--	110.29	--	2.731**	--	103.70	--	2.614**	--	90.44	--	2.491**	--	87.81
$\ln(\overline{X})$		2.01				1.99				1.85				1.73		
ln(SD)		1.39				1.48				1.51				1.51		
R²		.87				.87				.85				.83		
R²adj.		.87				.87				.85				.83		
N		2,450				2,598				2,739				2,952		

*p≤.05
**p≤.01

''Regression equation is weighted. For formula, see Table 5-1.
For a definition of statistics used, see Tables 5-8 and A-1.

TABLE A-17

Regression of the Logarithm of the Malignant Neoplasm Death Rate on Age and Region, Conditioning on Sex and Year, Canada'''

	MALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
A1	-.70	-3.162**	-.85	-113.78	-.68	-3.279**	-.83	-128.75	-.67	-3.236**	-.82	-143.18	-.68	-3.367**	-.83	-145.21
A2	-.44	-1.869**	-.64	-84.69	-.47	-2.044**	-.66	-101.58	-.48	-2.081**	-.68	-116.29	-.47	-2.042**	-.66	-113.60
A3	-.05	-.863**	-.34	-45.33	-.09	-1.014**	-.38	-58.00	-.09	-1.024**	-.39	-66.90	-.08	-.968**	-.37	-63.84
R1	-.02	.065**	.02	2.47	-.01	.104**	.03	4.31	-.01	.058**	.02	2.67	.01	.136**	.04	6.26
R2	.03	.199**	.08	8.46	.04	.227**	.09	10.65	.07	.298**	.12	15.85	.04	.254**	.10	13.37
R3	.01	.109**	.05	4.84	.00	.148**	.06	7.17	-.02	.068**	.03	3.66	.00	.134**	.05	7.22
R4	.01	.053*	.02	2.05	-.01	.058*	.02	2.42	-.01	.013	.00	.62	-.02	.037	.01	1.77
a	--	2.190**	--	117.93	--	2.360**	--	139.17	--	2.495**	--	164.27	--	2.530**	--	164.22
$\ln(\overline{X})$			1.51				1.65				1.77				1.85	
ln(SD)			1.06				1.11				1.11				1.11	
R'			.89				.91				.91				.90	
R'adj.			.89				.90				.91				.90	
N			2,124				2,461				2,834				3,260	

* $p \leq .05$
**$p \leq .01$

'''Regression equation is weighted. For formula, see Table 5-1.
For a definition of statistics used, see Tables 5-1 and 5-8.

TABLE A-18

Regression of the Logarithm of the Malignant Neoplasm Death Rate on Age and Region, Conditioning on Sex and Year, Canada''

	FEMALES															
	1951				1961				1971				1981			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
A1	-.71	-2.302**	-.90	-106.89	-.70	-2.378**	-.89	-119.30	-.70	-2.463**	-.87	-127.89	-.72	-2.596**	-.87	-149.97
A2	-.36	-1.362**	-.61	-72.36	-.38	-1.406**	-.63	-83.27	-.41	-1.445**	-.64	-92.62	-.42	-1.489**	-.62	-105.82
A3	.01	-.688**	-.34	-39.74	-.03	-.770**	-.37	-48.52	-.03	-.735**	-.36	-52.04	-.05	-.730**	-.35	-59.57
R1	.02	.059**	.03	2.47	.02	.183**	.08	8.44	.01	.126**	.05	6.22	-.01	-.011	-.00	-.61
R2	.07	.222**	.11	10.50	.07	.252**	.13	13.10	.08	.260**	.13	14.91	-.02	-.001	-.00	-.07
R3	-.01	.058**	.03	2.83	-.01	.113**	.06	6.01	-.04	.072**	.04	4.21	.02	.042**	.02	2.84
R4	-.02	-.003	-.00	-.14	-.03	.077**	.03	3.49	-.00	.072**	.03	3.65	-.00	-.017	-.01	-1.03
a	--	1.958**	--	109.68	--	1.872**	--	116.41	--	1.905**	--	130.57	--	2.026**	--	162.98
ln($\overline{X}$)		1.34				1.29				1.34				1.38		
ln(SD)		.86				.87				.87				.88		
R²		.87				.88				.89				.90		
R²adj.		.87				.88				.89				.90		
N		2,108				2,345				2,714				3,136		

* p≤.05
** p≤.01

''Regression equation is weighted. For formula, see Table 5-1. For a definition of statistics used, see Tables 5-1 and 5-8.

TABLE A-19

Regression of the Ratio of Female to Male Cardiovascular Disease Death Rates''' on Time, Controlling for Marital Status and Region, Conditioning on Age, Canada

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.01	-11.939*	-.27	-2.05	.07	-5.808	-.20	-1.56	.06	-8.355*	-.26	-2.11
Y2(71)	-.17	-17.908**	-.40	-3.03	-.21	-11.730**	-.42	-3.23	-.28	-16.645**	-.51	-4.20
Y3(81)	-.18	-18.170**	-.40	-3.08	-.19	-11.127**	-.40	-3.06	-.18	-14.253**	-.44	-3.59
M1(S)	.15	-2.338	-.05	-.43	-.21	-7.040*	-.25	-1.97	-.01	-2.608	-.08	-.66
M2(W)	-.09	-9.857	-.18	-1.45	.18	1.036	.04	.29	.16	1.503	.05	.38
M3(D)	-.33	-17.188**	-.40	-3.18	-.10	-4.216	-.14	-1.12	-.24	-8.173*	-.25	-2.06
R1(A)	-.12	-2.727	-.05	-.40	.03	4.363	.14	1.05	.08	3.140	.09	.71
R2(Q)	-.11	-2.621	-.06	-.40	.05	4.253	.14	1.04	-.14	-3.077	-.09	-.69
R3(O)	-.06	-.564	-.01	-.09	-.12	.268	.01	.07	-.07	-1.163	-.03	-.26
R4(BC)	.30	13.296*	.26	1.97	.18	7.370	.24	1.84	.15	5.061	.14	1.14
a	--	44.093**	--	6.78	--	32.736**	--	7.73	--	44.414**	--	9.55
$\overline{X}$			26.16				26.16				33.07	
S.D.			19.60				12.40				14.20	
R^2			.37				.28				.32	
R^2adj.			.26				.17				.22	
N			68				77				80	

TABLE A-19
(Continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.13	-6.603	-.17	-1.67	.05	-5.822	-.18	-1.47
Y2(71)	-.22	-17.877**	-.45	-4.47	-.15	-9.254*	-.29	-2.40
Y3(81)	-.28	-18.333**	-.47	-4.63	-.14	-9.135*	-.29	-2.37
M1(S)	-.06	-13.019**	-.33	-3.34	.18	2.191	.07	.58
M2(W)	.17	-6.382	-.16	-1.64	.18	2.161	.07	.57
M3(D)	-.50	-26.665**	-.66	-6.63	-.47	-13.456**	-.40	-3.37
R1(A)	.02	-2.395	-.05	-.53	.21	10.106*	.28	2.26
R2(Q)	-.03	-2.336	-.06	-.54	.12	8.388	.24	1.94
R3(O)	.07	.847	.02	.19	-.04	4.075	.12	.94
R4(BC)	-.10	-4.713	-.11	-1.08	-.13	1.423	.04	.33
a	--	63.405**	--	13.80	--	63.890**	--	14.19
$\overline{X}$			39.83				60.64	
S.D.			17.12				14.04	
R^2			.55				.36	
R^2adj.			.48				.27	
N			78				77	

*p≤.05, **p≤.01

TABLE A-19
(continued)

(1) Ratio: Female cardiovascular disease death rates, by age group and year/male cardiovascular disease death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-20

Regression of the Ratio of Female to Male Cardiovascular Disease Death Rates(1) on Time, Controlling for Marital Status and Conditioning on Age and Region, Canada

	ATLANTIC REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.05	-20.618	-.42	-1.53	.01	-10.581	-.33	-.87	-.45	-19.343*	-.69	-2.31
Y2(71)	-.09	-24.064	-.45	-1.79	-.47	-18.406	-.63	-1.57	-.19	-13.921	-.49	-1.66
Y3(81)	-.21	-28.892	-.54	-2.14	.07	-7.093	-.24	-.61	.17	-6.443	-.23	-.77
M1(S)	-.10	-23.494	-.44	-2.08	.12	-.346	-.01	-.03	.30	8.215	.29	.98
M2(W)	-.08	-29.221	-.35	-1.66	.00	-2.751	-.10	-.26	.02	2.254	.08	.27
M3(D)	-.64	-46.815**	-.95	-4.63	-.34	-9.886	-.26	-.73	-.22	-2.712	-.10	-.32
a	--	65.257**	--	5.78	--	38.856**	--	3.70	--	43.408**	--	5.55
$\bar{X}$			21.23				27.01				35.42	
S.D.			24.37				13.65				12.60	
R^2			.84				.36				.47	
R^2adj.			.66				-.18				.12	
N			12				14				16	

TABLE A-20
(Continued)

	ATLANTIC REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	-.02	-12.221	-.28	-1.54	.12	-9.469	-.41	-1.73
Y2(71)	-.19	-28.091**	-.58	-3.43	-.28	-17.978**	-.86	-3.39
Y3(81)	-.30	-21.221*	-.48	-2.68	-.42	-20.117**	-.96	-3.79
M1(S)	-.02	-19.192*	-.44	-2.71	.28	9.215	.44	1.94
M2(W)	-.05	-20.030*	-.46	-2.83	.01	5.148	.25	1.09
M3(D)	-.66	-49.225**	-.87	-5.38	.06	13.568	.50	2.22
a	--	74.515**	--	10.52	--	73.687**	--	15.53
$\overline{X}$			40.70				66.82	
S.D.			20.58				9.80	
R^2			.87				.75	
R^2adj.			.76				.53	
N			14				14	

*p≤.05
**p≤.01

[1] Ratio: Female cardiovascular disease death rates, by age group and year/male cardiovascular disease death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-21

Regression of the Ratio of Female to Male Cardiovascular Disease Death Rates(1) on Time, Controlling for Marital Status and Conditioning on Age and Region, Canada

	QUEBEC REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.23	-21.933**	-.65	-4.21	.11	-3.570	-.10	-.26	-.03	-4.770	-.14	-.67
Y2(71)	-.18	-19.780**	-.61	-3.96	-.16	-8.905	-.28	-.72	-.18	-8.462	-.24	-1.18
Y3(81)	-.23	-21.010**	-.65	-4.21	-.17	-9.209	-.29	-.75	.06	-2.387	-.07	-.33
M1(S)	.32	-2.410	-.08	-.53	-.20	-9.026	-.29	-.73	-.13	-14.934	-.43	-2.08
M2(W)	-.14	-13.414*	-.42	-2.97	.16	-.729	-.02	-.06	.43	-.401	-.01	-.06
M3(D)	-.67	-23.845**	-.67	-4.78	-.16	-8.262	-.24	-.61	-.74	-30.750**	-.88	-4.28
a	--	47.453**	--	10.51	--	37.086**	--	3.19	--	44.630**	--	6.65
$\overline{X}$			21.98				27.29				29.20	
S.D.			14.75				14.52				15.57	
R²			.89				.17				.75	
R²adj.			.81				-.45				.58	
N			15				15				16	

TABLE A-21
(Continued)

	QUEBEC REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.10	-1.157	-.03	-.10	.09	2.895	.06	.18
Y2(71)	-.06	-6.650	-.14	-.60	-.06	-2.357	-.05	-.15
Y3(81)	-.17	-10.641	-.23	-.95	-.04	-1.714	-.04	-.11
M1(S)	-.01	-16.732	-.36	-1.50	.05	-10.058	-.22	-.63
M2(W)	.28	-6.420	-.14	-.58	.11	-7.922	-.17	-.50
M3(D)	-.73	-41.823**	-.89	-3.75	-.51	-29.639	-.64	-1.86
a	--	59.705**	--	5.72	--	76.148**	--	5.11
$\overline{X}$			38.85				63.95	
S.D.			20.97				20.87	
R^2			.66				.30	
R^2adj.			.43				-.17	
N			16				16	

*p≤.05
**p≤.01

(1)Ratio: Female cardiovascular disease death rates, by age group and year/male cardiovascular disease death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-22

Regression of the Ratio of Female to Male Cardiovascular Disease Death Rates(1) on Time, Controlling for Marital Status and Conditioning on Age and Region, Canada

	ONTARIO REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.19	-13.702	-.53	-1.67	.19	-5.195	-.27	-1.47	.06	-10.458**	-.58	-4.61
Y2(71)	.04	-9.153	-.35	-1.11	-.54	-15.885**	-.81	-4.50	-.44	-17.279**	-.96	-7.61
Y3(81)	-.36	-16.974	-.65	-2.07	-.20	-10.972**	-.56	-3.11	-.46	-17.536**	-.97	-7.73
M1(S)	.17	.102	.00	.01	-.21	-5.957	-.30	-1.69	-.01	-2.560	-.14	-1.13
M2(W)	-.20	-7.047	-.27	-.86	.41	3.157	.16	.89	.08	-1.469	-.08	-.65
M3(D)	-.12	-5.531	-.21	-.67	-.40	-8.868*	-.45	-2.51	-.26	-5.963*	-.33	-2.63
a	--	37.256**	--	4.85	--	34.213**	--	10.36	--	44.933**	--	21.17
$\bar{X}$			24.18				23.28				31.12	
S.D.			11.64				8.78				8.09	
R^2			.40				.81				.91	
R^2adj.			.00				.68				.84	
N			16				16				16	

TABLE A-22
(Continued)

	ONTARIO REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.15	-13.787*	-.46	-2.87	.07	-5.134	-.18	-.85
Y2(71)	-.48	-27.735**	-.93	-5.78	-.43	-16.290*	-.56	-2.68
Y3(81)	-.44	-26.794**	-.90	-5.58	.05	-5.651	-.19	-.93
M1(S)	-.14	-7.534	-.25	-1.57	.47	10.677	.36	1.76
M2(W)	.11	-2.018	-.07	-.42	.21	5.095	.17	.84
M3(D)	-.16	-7.989	-.27	-1.67	-.66	-14.134*	-.48	-2.33
a	--	63.496**	--	14.15	--	65.996**	--	11.61
$\overline{X}$			42.03				59.64	
S.D.			13.28				13.12	
R'			.84				.74	
R'adj.			.74				.57	
N			16				16	

*p≤.05
**p≤.01

'''Ratio: Female cardiovascular disease death rates, by age group and year/male cardiovascular disease death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-23

Regression of the Ratio of Female to Male Cardiovascular Disease Death Rates'' on Time, Controlling for Marital Status and Conditioning on Age and Region, Canada

	PRAIRIES REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.17	-15.754	-.36	-1.66	.16	-3.663	-.17	-.56	.44	8.887	.22	.65
Y2(71)	-.25	-18.583	-.43	-1.96	-.04	-6.838	-.32	-1.05	-.28	-13.212	-.33	-.97
Y3(81)	-.11	-13.765	-.32	-1.45	-.51	-14.479*	-.67	-2.22	-.32	-14.318	-.35	-1.05
M1(S)	.43	7.910	.20	.96	-.15	-7.805	-.36	-1.20	.03	-.821	-.02	-.06
M2(W)	.34	5.814	.08	.41	-.15	-7.858	-.37	-1.20	.07	.410	.01	.03
M3(D)	-.78	-25.637*	-.64	-3.12	-.03	-5.938	-.28	-.91	-.16	-6.473	-.16	-.47
a	--	42.354**	--	5.16	--	34.660**	--	5.68	--	38.663**	--	3.02
$\overline{X}$			26.25				23.01				32.28	
S.D.			19.16				9.62				18.21	
R'			.82				.45				.32	
R'adj.			.63				.08				-.13	
N			13				16				16	

TABLE A-23
(Continued)

	PRAIRIES REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.37	-1.202	-.03	-.18	.03	-10.892*	-.50	-2.75
Y2(71)	-.36	-20.293**	-.58	-3.02	-.08	-10.950*	-.55	-3.06
Y3(81)	-.43	-22.153**	-.63	-3.30	-.63	-19.027**	-.96	-5.31
M1(S)	-.04	-10.648	-.30	-1.59	-.17	-3.623	-.18	-1.01
M2(W)	.17	-5.126	-.15	-.76	.35	3.993	.20	1.12
M3(D)	-.50	-22.882**	-.65	-3.41	-.29	-6.418	-.29	-1.62
a	--	61.761**	--	9.84	--	67.649**	--	20.04
$\overline{X}$			41.19				56.29	
S.D.			15.66				9.06	
R^2			.78				.82	
R^2adj.			.63				.69	
N			16				15	

*p≤.05
**p≤.01

''Ratio: Female cardiovascular disease death rates, by age group and year/male cardiovascular disease death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-24

Regression of the Ratio of Female to Male Cardiovascular Disease Death Rates''' on Time, Controlling for Marital Status and Conditioning on Age and Region, Canada

	BRITISH COLUMBIA REGION											
	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	.49	20.373	.36	.91	-.03	-7.654	-.24	-.89	.13	-16.089**	-.49	-3.03
Y2(71)	-.38	-16.299	-.29	-.73	-.02	-7.637	-.24	-.88	-.45	-30.351**	-.92	-5.71
Y3(81)	-.13	-5.702	-.10	-.25	-.24	-12.904	-.40	-1.49	-.46	-30.581**	-.93	-5.75
M1(S)	-.02	6.884	.13	.35	-.59	-12.064	-.37	-1.40	-.21	-2.940	-.09	-.55
M2(W)	--	--	--	--	.45	13.361	.41	1.55	.18	6.723	.20	1.26
M3(D)	.24	15.717	.30	.81	.24	8.299	.26	.96	.11	5.032	.15	.95
a	--	31.750	--	1.63	--	35.034**	--	4.33	--	54.394**	--	10.93
$\overline{X}$			38.88				30.38				37.34	
S.D.			25.52				14.52				14.78	
R²			.37				.58				.85	
R²adj.			-.16				.29				.74	
N			12				16				16	

TABLE A-24
(Continued)

	BRITISH COLUMBIA REGION							
	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	.10	-2.383	-.07	-.20	-.08	-5.988	-.22	-.84
Y2(71)	-.15	-9.170	-.26	-.78	-.05	-5.373	-.20	-.76
Y3(81)	-.13	-8.594	-.24	-.73	-.08	-5.847	-.21	-.82
M1(S)	-.15	-10.991	-.31	-.93	.32	4.742	.17	.67
M2(W)	.32	1.685	.05	.14	.31	4.492	.16	.63
M3(D)	-.43	-18.490	-.52	-1.57	-.73	-16.777*	-.61	-2.36
a	--	48.458**	--	4.40	--	63.172**	--	9.50
$\overline{X}$			36.47				56.99	
S.D.			16.00				12.24	
R'			.35				.60	
R'adj.			-.09				.33	
N			16				16	

*p≤.05
**p≤.01

'''Ratio: Female cardiovascular disease death rates, by age group and year/male cardiovascular disease death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-25

Regression of the Ratio of Female to Male Malignant Neoplasm Death Rates(1) on Time, Controlling for Marital Status and Region, Conditioning on Age, Canada

	35-44				45-54				55-64			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.16	-16.676	-.31	-1.07	-.18	12.238	.23	1.29	.12	-.033	-.00	-.01
Y2(71)	.03	-12.765	-.27	-.89	.43	27.690**	.59	3.01	.06	-2.761	-.07	-.48
Y3(81)	.19	-.436	-.01	-.03	.08	16.790	.38	1.97	-.27	-11.978*	-.31	-2.09
M1(S)	.41	-2.338	-.05	-.10	.17	-7.910	-.15	-.75	.03	-3.714	-.09	-.67
M2(W)	-.28	-34.784	-.66	-1.31	.11	-4.881	-.11	-.47	.11	-3.530	-.09	-.68
M3(D)	-.27	-20.527	-.47	-.82	-.51	-19.803	-.46	-1.91	-.38	-18.209**	-.45	-3.38
R1(A)	-.02	-16.661	-.31	-1.05	.21	7.202	.14	.68	.22	5.550	.13	.91
R2(Q)	.05	-15.175	-.26	-.84	-.05	-.821	-.02	-.08	-.08	-4.379	-.10	-.71
R3(O)	.01	-5.257	-.09	-.30	.12	7.250	.14	.65	-.15	-6.427	-.15	-1.07
R4(BC)	-.37	-34.363*	-.72	-2.28	-.32	-8.774	-.16	-.74	-.02	-4.515	-.10	-.71
a	--	103.242**	--	4.37	--	64.751**	--	4.85	--	82.981**	--	12.72
$\bar{X}$			62.40				71.54				71.06	
S.D.			22.04				21.18				17.42	
R'			.59				.53				.30	
R'adj.			.27				.35				.18	
N			24				36				68	

TABLE A-25
(Continued)

	65-69				70+			
	r	b	B	t	r	b	B	t
Y1(61)	-.14	-14.168*	-.29	-2.30	.02	-9.287	-.22	-1.64
Y2(71)	-.11	-14.277*	-.29	-2.33	-.06	-10.511	-.25	-1.89
Y3(81)	-.04	-10.756	-.22	-1.78	-.19	-13.306*	-.32	-2.41
M1(S)	.21	.671	.01	.12	.28	5.862	.14	1.13
M2(W)	.05	-5.306	-.11	-.91	.01	-4.219	-.10	-.84
M3(D)	-.50	-26.326**	-.52	-4.36	-.49	-21.729**	-.46	-3.88
R1(A)	-.14	-11.555	-.21	-1.66	-.02	2.752	.06	.46
R2(Q)	-.09	-10.408	-.20	-1.53	.16	9.566	.20	1.58
R3(O)	.05	-3.920	-.08	-.59	-.11	-2.383	-.05	-.40
R4(BC)	.01	-5.512	-.11	-.82	.01	2.013	.04	.34
a	--	81.504**	--	11.80	--	66.373**	--	10.55
$\overline{X}$			58.04				55.97	
S.D.			21.52				18.65	
R^2			.38				.37	
R^2adj.			.28				.27	
N			75				72	

*p≤.05, **p≤.01

TABLE A-25
(continued)

'''Ratio: Female malignant neoplasm death rates, by age group and year/male malignant neoplasm death rates, by age group and year X 100.

For a definition of statistics used, see Table 5-1.

TABLE A-26

Regression of the Ratio of Female to Male Malignant Neoplasm Death Rates(1) on Time, Controlling for Marital Status(2) and Conditioning on Age(3), by Region

	ATLANTIC REGION															
	45-54				55-64				65-69				70+			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.44	-17.165	-.42	-.87	.19	5.015	.15	.32	.09	-17.874	-.29	-.68	-.26	-43.822*	-.87	-2.71
Y2(71)	.65	14.267	.51	.99	-.03	-.296	-.01	-.02	-.12	-26.893	-.44	-1.03	.17	-28.526	-.57	-1.77
Y3(81)	-.12	-5.589	-.18	-.32	-.14	-2.749	-.09	-.19	-.17	-29.084	-.48	-1.11	-.36	-47.474*	-.95	-2.94
M1(S)	-.29	-18.104	-.57	-1.05	.01	-1.730	-.05	-.12	.32	14.020	.21	.60	.18	7.604	.14	.53
M2(O)	-.06	-2.938	-.11	-.20	-.08	-2.274	-.08	-.20	-.46	-19.082	-.35	-1.02	-.40	-14.962	-.33	-1.30
a	--	84.103*	--	4.75	--	79.910**	--	6.14	--	79.373**	--	3.47	--	95.148**	--	6.75
$\overline{X}$			79.92				78.61				51.74				55.06	
S.D.			14.63				14.62				28.47				23.52	
R^2			.70				.05				.34				.63	
R^2adj.			-.05				-.55				-.08				.40	
N			8				14				14				14	

*p≤.05
**p≤.01
(1) Ratio: Female malignant neoplasm death rates, by age group and year/male malignant neoplasm death rates, by age group and year X 100.
(2) Marital categories of widowed and divorced are collapsed together, due to small numbers of each.
(3) Those age groups whose N is less than 8 will be omitted due to insufficient data for analysis. This includes ages 35-44 whose N=5.

TABLE A-27

Regression of the Ratio of Female to Male Malignant Neoplasm Death Rates(1) on Time, Controlling for Marital Status(2) and Conditioning on Age(3), by Region

	QUEBEC REGION															
	45-54				55-64				65-69				70+			
	r	b	B	t	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	.11	16.630	.36	.91	.45	.876	.02	.13	-.36	-36.888*	-.83	-2.96	-.04	-17.696	-.50	-1.07
Y2(71)	.28	10.973	.27	.63	-.09	-13.759	-.36	-2.00	-.07	-27.456	-.62	-2.21	-.17	-20.947	-.59	-1.27
Y3(81)	-.08	-2.565	-.07	-.15	-.64	-28.645**	-.76	-4.17	-.20	-31.886*	-.72	-2.56	-.14	-20.203	-.57	-1.22
M1(S)	.15	-5.612	-.09	-.24	.59	12.992	.34	2.13	.20	-.723	-.02	-.06	-.09	-3.713	-.10	-.25
M2(O)	-.58	-29.364	-.73	-1.86	-.52	-10.392	-.30	-1.92	-.37	-11.441	-.29	-1.12	-.13	-5.760	-.18	-.49
a	--	86.900**	--	4.27	--	81.760**	--	10.80	--	85.335**	--	7.54	--	82.364**	--	5.72
$\bar{X}$		70.12				68.41				54.14				61.88		
S.D.		18.75				17.77				20.27				16.62		
R^2		.53				.88				.59				.23		
R^2adj		.06				.81				.36				-.25		
N		11				14				15				14		

*p≤.05

**p≤.01

(1) Ratio: Female malignant neoplasm death rates, by age group and year/male malignant neoplasm death rates, by age group and year X 100.

(2) Marital categories of widowed and divorced are collapsed together, due to small numbers of each.

(3) Those age groups whose N is less than 8 will be omitted due to insufficient data for analysis. This includes ages 35-44 whose N=4.

TABLE A-28

Regression of the Ratio of Female to Male Malignant Neoplasm Death Rates(1) on Time, Controlling for Marital Status(2) and Conditioning on Age(3), by Region

	ONTARIO REGION											
	55-64				65-69				70+			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.08	4.457	.14	.37	-.11	-8.819	-.26	-.99	.21	-.706	-.01	-.05
Y2(71)	.26	12.400	.39	1.04	-.07	-7.883	-.24	-.88	-.23	-13.663	-.29	-.98
Y3(81)	-.00	6.256	.20	.52	-.06	-7.656	-.23	-.86	-.12	-9.842	-.21	-.70
M1(S)	-.01	-12.033	-.34	-1.01	.60	12.581	.38	1.41	.50	12.278	.26	.88
M2(O)	-.36	-14.461	-.52	-1.54	-.61	-11.177	-.39	-1.44	-.57	-16.450	-.40	-1.32
a	--	70.031**	--	4.47	--	68.576**	--	8.20	--	62.686**	--	4.76
$\overline{X}$			66.08				60.04				51.87	
S.D.			14.50				14.92				21.35	
R^2			.28				.52				.45	
R^2adj.			-.12				.28				.14	
N			15				16				15	

*p≤.05
**p≤.01

(1) Ratio: Female malignant neoplasm death rates, by age group and year/male malignant neoplasm death rates, by age group and year X 100.

(2) Marital categories of widowed and divorced are collapsed together, due to small numbers of each.

(3) Those age groups whose N is less than 8 will be omitted due to insufficient data for analysis. This includes ages 35-44 whose N=4 and ages 45-54 whose N=7.

For a definition of statistics used, see Table 5-1.

TABLE A-29

Regression of the Ratio of Female to Male Malignant Neoplasm Death Rates(1) on Time, Controlling for Marital Status(2) and Conditioning on Age(3), by Region

	PRAIRIES REGION											
	55-64				65-69				70+			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	-.24	-17.695	-.41	-.96	-.14	-5.866	-.10	-.28	-.00	-10.977	-.41	-1.46
Y2(71)	.09	-5.740	-.14	-.32	-.19	-8.115	-.14	-.39	-.18	-17.086	-.58	-2.14
Y3(81)	-.14	-13.078	-.30	-.67	.36	15.589	.30	.81	-.35	-17.555*	-.66	-2.33
M1(S)	-.14	-11.756	-.23	-.57	.20	5.532	.11	.29	.43	5.018	.19	.73
M2(O)	-.11	-8.573	-.23	-.60	-.23	-10.679	-.23	-.60	-.54	-9.722	-.40	-1.53
a	--	87.664**	--	5.43	--	67.288**	--	3.66	--	69.577**	--	10.15
$\overline{X}$			72.37				65.75				55.03	
S.D.			19.10				24.33				12.54	
R^2			.18				.22				.63	
R^2adj.			-.40				-.27				.39	
N			13				14				14	

*p≤.05
**p≤.01
(1) Ratio: Female malignant neoplasm death rates, by age group and year/male malignant neoplasm death rates, by age group and year X 100.
(2) Marital categories of widowed and divorced are collapsed together, due to small numbers of each.
(3) Those age groups whose N is less than 8 will be omitted due to insufficient data for analysis. This includes ages 35-44 whose N=4 and ages 45-54 whose N=4.
For a definition of statistics used, see Table 5-1.

TABLE A-30

Regression of the Ratio of Female to Male Malignant Neoplasm Death Rates[1] on Time, Controlling for Marital Status[2] and Conditioning on Age[3], by Region

	BRITISH COLUMBIA REGION											
	55-64				65-69				70+			
	r	b	B	t	r	b	B	t	r	b	B	t
Y1(61)	.35	11.432	.27	.68	-.24	-21.355	-.51	-1.81	.20	10.801	.24	.71
Y2(71)	.05	1.390	.03	.06	-.08	-16.279	-.39	-1.38	.02	6.075	.15	.43
Y3(81)	-.45	-14.855	-.32	-.80	-.13	-17.881	-.43	-1.52	-.02	4.793	.12	.34
M1(S)	-.32	-22.032	-.48	-1.31	-.19	-22.360	-.53	-1.90	.44	14.275	.36	1.01
M2(O)	-.10	-15.622	-.38	-1.02	-.28	-21.438	-.59	-2.10	-.34	-4.204	-.12	-.34
a	--	81.844**	--	5.10	--	88.639**	--	8.05	--	49.367**	--	3.73
$\overline{X}$			70.16				58.45				56.27	
S.D.			20.95				18.76				18.37	
R²			.43				.47				.25	
R²adj.			-.05				.21				-.17	
N			12				16				15	

*p≤.05

**p≤.01

[1] Ratio: Female malignant neoplasm death rates, by age group and year/male malignant neoplasm death rates, by age group and year X 100.

[2] Marital categories of widowed and divorced are collapsed together, due to small numbers of each.

[3] Those age groups whose N is less than 8 will be omitted due to insufficient data for analysis. This includes ages 35-44 whose N=7 and ages 45-54 whose N=6.

For a definition of statistics used, see Table 5-1.

TABLE A-31

Logarithm of the General Death Rate Regressed on Marital Status, Controlling for Sex, Age and Region, 1951 to 1981, for Canada''

	1951				1961				1971			
	r	b	B	t	r	b	B	t	r	b	B	t
M1(S)	.02	.338**	.13	32.76	.03	.349**	.13	34.13	.06	.448**	.17	43.24
M2(W)	.18	.297**	.12	27.51	.18	.351**	.13	32.77	.20	.500**	.18	46.11
M3(D)	-.01	.561**	.10	25.49	-.00	.638**	.12	32.84	-.00	.550**	.14	35.85
S1(F)	-.09	-.351**	-.17	-42.26	-.11	-.504**	-.23	-61.20	-.14	-.627**	-.29	-76.07
A1(35-44)	-.65	-2.676**	-.91	-212.58	-.63	-2.877**	-.88	-227.16	-.60	-2.725**	-.84	-213.44
A2(45-54)	-.39	-1.864**	-.71	-164.19	-.39	-1.988**	-.71	-179.39	-.39	-1.917**	-.69	-173.15
A3(55-64)	.03	-1.008**	-.42	-97.45	-.02	-1.152**	-.45	-113.00	-.05	-1.129**	-.45	-112.12
R1(A)	.00	.095**	.03	6.78	.01	.137**	.04	9.81	.02	.098**	.03	7.01
R2(Q)	-.00	.229**	.09	18.06	-.01	.204**	.08	16.43	.01	.161**	.06	13.04
R3(O)	.01	.141**	.06	11.61	.02	.178**	.07	14.96	.00	.097**	.04	8.16
R4(BC)	.02	.096**	.03	6.84	.01	.099**	.03	7.20	-.00	.088**	.03	6.42
a	--	3.743**	--	316.88	--	3.772**	--	324.56	--	3.757**	--	320.80
ln($\overline{X}$)			2.81				2.76				2.77	
ln(SD)			1.05				1.12				1.09	
R'			.89				.90				.88	
R'adj.			.89				.90				.88	

TABLE 31
(continued)

	1951				1961				1971			
	r	b	B	t	r	b	B	t	r	b	B	t
N	7,233				7,829				8,856			

TABLE A-31
(continued)

	1981			
	r	b	B	t
M1(S)	.08	.586**	.21	55.85
M2(W)	.22	.637**	.23	60.16
M3(D)	-.01	.622**	.18	49.12
S1(F)	-.14	-.672**	-.30	-83.26
A1	-.59	-2.821**	-.81	-220.53
A2	-.39	-1.951**	-.66	-176.73
A3	-.08	-1.153**	-.44	-118.09
R1(A)	.02	.038**	.01	2.73
R2(Q)	-.01	.010	.00	.83
R3(D)	.01	.034**	.01	2.95
R4(BC)	-.01	-.036**	-.01	-2.70
a	--	3.697**	--	325.58
$\ln(\overline{X})$			2.73	
ln(SD)			1.12	
R^2			.88	
R^2adj.			.88	
N			9,781	

*p≤.05

TABLE A-31
(continued)

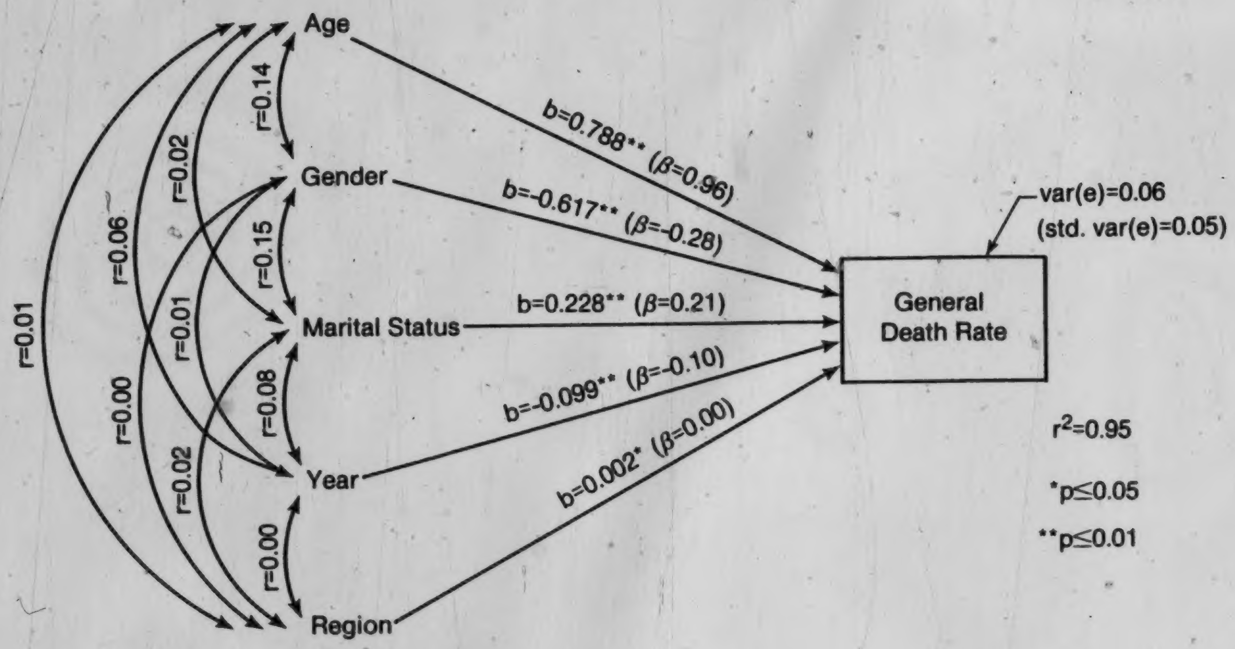
**$p \leq .01$

'''Regression equation is weighted. For formula, see Table 5-1.

For a definition of statistics used, see Tables 5-1 and 5-8.

FIGURE A-1

A Recursive Model Involving the Logarithm[1] of the General Death Rate Regressed on Age, Gender, Marital Status, Year, and Region for Canada[2].


Age
Gender
Marital Status
Year
Region
r=0.14
r=0.15
r=0.08
r=0.00
r=0.02
r=0.01
r=0.02
r=0.06
r=0.00
r=0.01
b=0.788** (β=0.96)
b=-0.617** (β=-0.28)
b=0.228** (β=0.21)
b=-0.099** (β=-0.10)
b=0.002* (β=0.00)
General Death Rate
var(e)=0.06
(std. var(e)=0.05)
r2=0.95
*p≤0.05
**p≤0.01

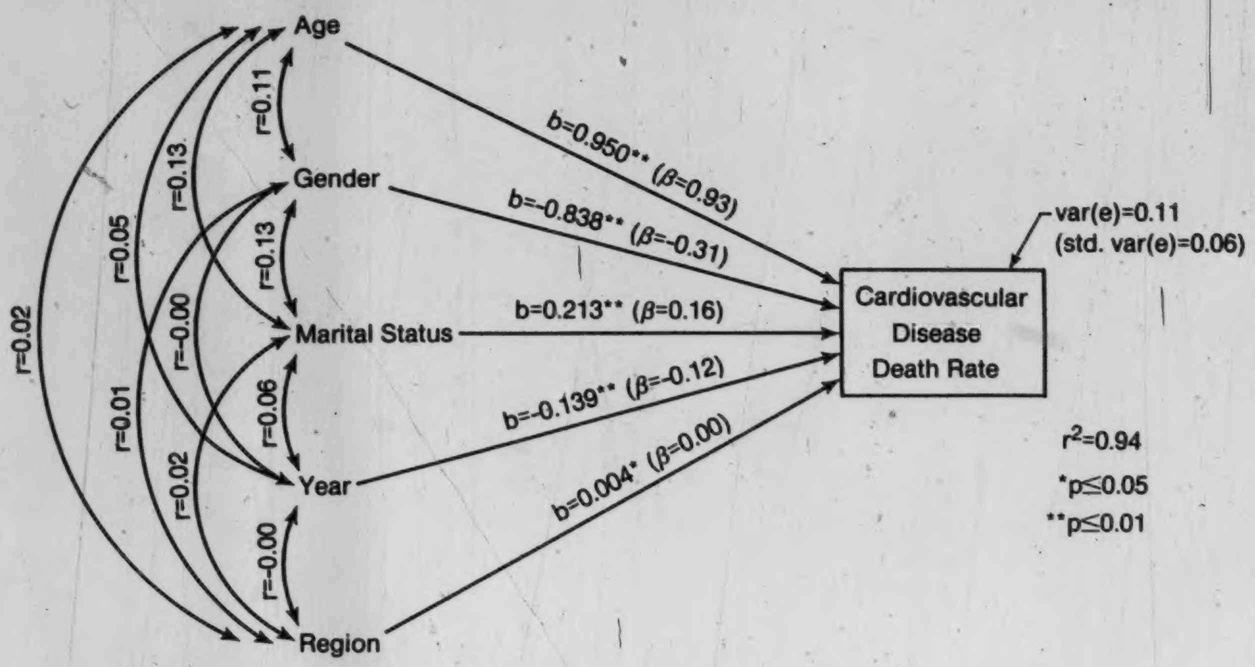
[1] Weighted. See Table 5-1 for weight formula.

[2] Reference categories: Age, 35-44=0, else=1; Gender, males=0, else=1; Martial Status, married=0, else=1; Year, 1951=0, else=1; Region, Prairies=0, else=1.

For the standard variance(e), formula used is $1-r^2$. For unstandardized variance(e), formula is $(1-r^2)\overset{\alpha}{y}^2$.

FIGURE A-2

A Recursive Model Involving the Logarithm[1] of the Cardiovascular Disease Death Rate Regressed on Age, Gender, Marital Status, Year, and Region for Canada[2].


Age
Gender
Marital Status
Year
Region
r=0.11
r=0.13
r=0.06
r=-0.00
r=0.13
r=-0.00
r=0.02
r=0.05
r=0.01
r=0.02
b=0.950** (β=0.93)
b=-0.838** (β=-0.31)
b=0.213** (β=0.16)
b=-0.139** (β=-0.12)
b=0.004* (β=0.00)
Cardiovascular Disease Death Rate
var(e)=0.11
(std. var(e)=0.06)
r²=0.94
*p≤0.05
**p≤0.01

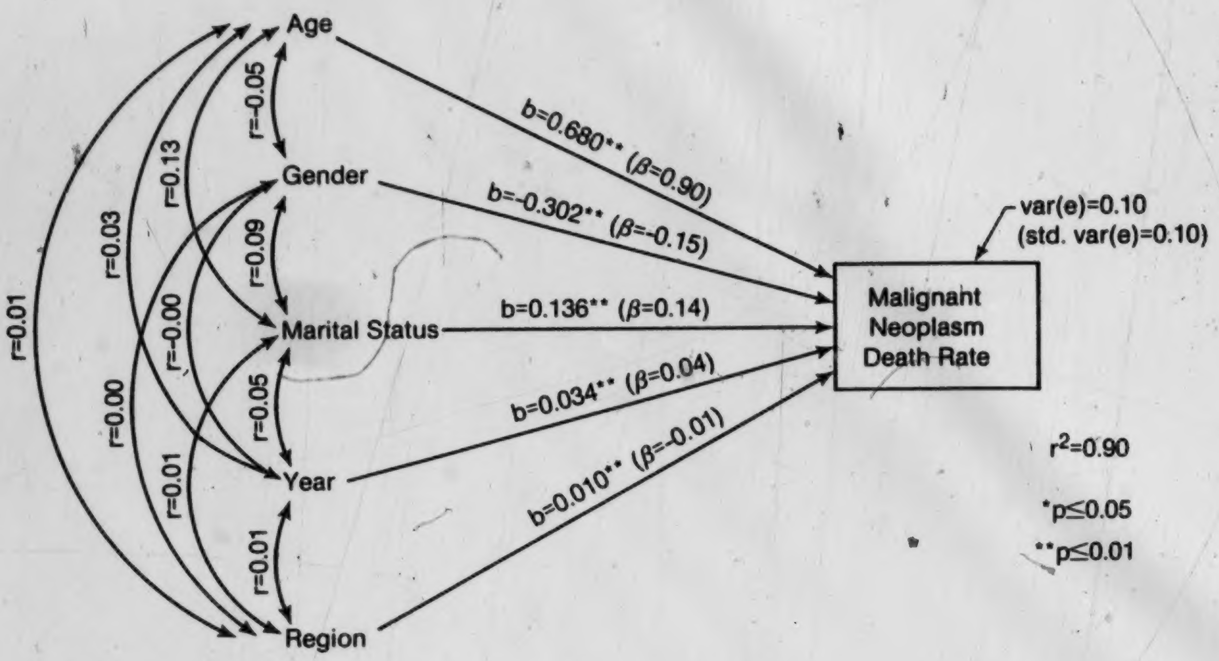
[1] Weighted. See Table 5-1 for weight formula.

[2] Reference categories: Age, 35-44=0, else=1; Gender, males=0, else=1; Martial Status, married=0, else=1; Year, 1951=0, else=1; Region, Prairies=0, else=1.

For the standard variance(e), formula used is $1-r^2$. For unstandardized variance(e), formula is $(1-r^2)\overset{\alpha}{y}^2$.

FIGURE A-3

A Recursive Model Involving the Logarithm[1] of the Malignant Neoplasm Death Rate Regressed on Age, Gender, Marital Status, Year, and Region for Canada[2].


Age
Gender
Marital Status
Year
Region
Malignant Neoplasm Death Rate
b=0.680** (β=0.90)
b=-0.302** (β=-0.15)
b=0.136** (β=0.14)
b=0.034** (β=0.04)
b=0.010** (β=-0.01)
var(e)=0.10
(std. var(e)=0.10)
r=-0.05
r=0.09
r=0.05
r=0.01
r=0.13
r=-0.00
r=0.01
r=0.03
r=0.00
r=0.01
r^2=0.90
*p≤0.05
**p≤0.01

[1] Weighted. See Table 5-1 for weight formula.

[2] Reference categories: Age, 35-44=0, else=1; Gender, males=0, else=1; Martial Status, married=0, else=1; Year, 1951=0, else=1; Region, Prairies=0, else=1.

For the standard variance(e), formula used is $1-r^2$. For unstandardized variance(e), formula is $(1-r^2)\overset{\alpha}{y}{}^2$.

APPENDIX B

TABLE B-1

Age-Specific Death Rates for Cardiovascular Disease Mortality, Malignant Neoplasm Mortality, and Chronic Disease Mortality, Canada: 1951-1981

	1951	1961	1971	1981
CARDIOVASCULAR DISEASE MORTALITY RATES				
(A1) 35-44	0.7	0.5	0.4	0.3
(A2) 45-54	2.3	2.2	1.8	1.3
(A3) 55-64	6.6	6.1	5.1	3.8
(A4) 65-69	12.3	12.5	10.4	8.2
(A5) 70+	34.0	33.6	30.6	25.3
MALIGNANT NEOPLASM MORTALITY RATES				
(A1) 35-44	0.6	0.5	0.5	0.4
(A2) 45-54	1.6	1.5	1.6	1.6
(A3) 55-64	3.7	3.7	4.0	4.1
(A4) 65-69	6.1	6.4	6.9	7.1
(A5) 70+	10.6	11.4	12.1	12.5
CHRONIC DISEASE MORTALITY RATES (1)				
(A1) 35-44	1.2	1.1	1.0	0.8
(A2) 45-54	3.9	3.7	3.4	2.9
(A3) 55-64	10.3	9.9	9.1	8.0
(A4) 65-69	18.4	18.9	17.3	15.2
(A5) 70+	44.6	45.1	42.7	37.7

(1) Chronic Disease Death Rates: Cardiovascular Disease and Malignant Neoplasm Mortality have been added together.

SOURCE: Table B-37.

TABLE B-2

Frequency and Percentage Distribution of Deaths by Age from Cardiovascular Disease (C) and Malignant Neoplasms (MN), 1951 to 1981, Canada

	TOTAL	AGE									
		35-44		45-54		55-64		65-69		70+	
		(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
1951											
(C)	38,995	1,212	(3.1)	3,169	(8.1)	7,103	(18.2)	5,334	(13.7)	22,177	(56.9)
(MN)	16,830	1,027	(6.1)	2,267	(13.5)	4,005	(23.8)	2,632	(15.6)	6,899	(41.0)
1961											
(C)	49,637	1,271	(2.6)	4,064	(8.2)	7,865	(15.8)	6,069	(12.2)	30,368	(61.2)
(MN)	22,379	1,232	(5.5)	2,876	(12.9)	4,819	(21.5)	3,129	(14.0)	10,323	(46.1)
1971											
(C)	54,755	1,106	(2.0)	4,065	(7.4)	8,814	(16.1)	6,438	(11.8)	34,332	(62.7)
(MN)	29,755	1,336	(4.5)	3,608	(12.1)	6,894	(23.2)	4,276	(14.4)	13,641	(45.8)
1981											
(C)	57,663	931	(1.6)	3,320	(5.8)	8,279	(14.4)	6,885	(11.9)	38,248	(66.3)
(MN)	37,955	1,295	(3.4)	2,922	(7.7)	8,907	(23.5)	5,964	(15.7)	18,867	(49.7)

SOURCES: Tables B-26 and B-27.

TABLE B-3

Ratios of Death Rates (Per 100,000 Pop) for Canada and Regions, Specific Ages, for 1951-1981

	1951	1961	1971	1981
CANADA				
Cardiovascular Disease Mortality Ratio⁽¹⁾				
35-44	23.0	24.2	19.2	18.3
45-54	33.2	37.2	32.2	28.5
(35-54)	29.6	33.0	28.1	25.4
Malignant Neoplasm Mortality Ratio⁽²⁾				
35-44	19.5	23.5	23.2	25.4
45-54	23.7	26.3	28.5	33.7
(35-54)	22.2	25.4	26.9	31.2
Chronic Disease Mortality Ratio⁽³⁾				
35-44	42.5	47.7	42.4	43.6
45-54	56.9	63.5	60.7	62.3
(35-54)	51.8	58.4	55.0	56.6
ATLANTIC				
Cardiovascular Disease Mortality Ratio				
35-44	17.9	21.6	22.1	20.9
45-54	29.6	34.6	31.8	30.2
(35-44)	25.1	30.4	29.0	27.3
Malignant Neoplasm Mortality Ratio				
35-44	16.3	24.9	24.4	28.4
45-54	23.9	27.2	29.5	34.8
(35-54)	20.9	26.5	28.0	32.8
Chronic Disease Mortality Ratio				
35-44	34.2	46.5	46.5	49.3
45-54	53.5	61.8	61.3	65.0
(35-54)	46.0	56.9	57.0	60.1
QUEBEC				
Cardiovascular Disease Mortality Ratio				
35-44	23.6	25.6	21.4	21.1
45-54	32.2	37.7	34.5	29.8
(35-54)	29.0	33.6	30.4	27.9
Malignant Neoplasm Mortality Ratio				
35-44	19.8	22.2	25.6	25.1
45-54	23.1	26.8	30.3	34.4

TABLE B-3
(continued)

	1951	1961	1971	1981
(35-54)	21.8	25.2	28.9	31.5
Chronic Disease Mortality Ratio				
35-44	43.3	47.8	47.0	46.2
45-54	55.2	64.4	64.8	64.3
(35-54)	50.8	58.9	59.2	58.6
ONTARIO				
Cardiovascular Disease Mortality Ratio				
35-44	25.4	26.1	19.4	18.7
45-54	36.9	39.5	33.1	29.1
(35-54)	33.1	35.3	28.8	26.2
Malignant Neoplasm Mortaltiy Ratio				
35-44	20.4	24.1	24.3	27.7
45-54	23.6	25.5	27.6	35.7
(35-54)	22.5	25.0	26.6	33.5
Chronic Disease Mortality Ratio				
35-44	45.8	50.2	43.7	46.3
45-54	60.5	64.9	60.7	64.8
(35-54)	55.6	60.3	55.4	59.7
PRAIRIES				
Cardiovascular Disease Mortality Ratio				
35-44	21.3	20.3	15.9	15.0
45-54	30.1	33.5	29.8	26.8
(35-54)	26.9	29.2	25.2	22.9
Malignant Neoplasm Mortality Ratio				
35-44	22.3	22.7	19.0	21.0
45-54	25.9	27.4	29.4	28.3
(35-54)	24.6	25.9	26.0	25.9
Chronic Disease Mortality Ratio				
35-44	43.5	42.9	34.8	36.0
45-54	56.0	60.9	59.2	55.1
(35-54)	51.6	55.1	51.2	48.8
BRITISH COLUMBIA				
Cardiovascular Disease Mortality Ratio				
35-44	21.2	21.7	14.9	13.4
45-54	30.2	34.9	26.3	24.6
(35-54)	27.1	30.5	22.7	20.8

TABLE B-3
(continued)

	1951	1961	1971	1981
Malignant Neoplasm Mortality Ratio				
35-44	14.3	25.5	18.0	23.9
45-54	22.7	25.5	25.0	32.1
(35-54)	19.8	25.5	22.8	29.3
Chronic Disease Mortality Ratio				
35-44	35.5	47.1	32.9	37.3
45-54	52.8	60.4	51.3	56.6
(35-54)	46.9	56.0	45.5	50.2

(1) Cardiovascular Disease Mortality Ratio: cardiovascular disease death rate for age group/ general death rate for age group X 100.

(2) Malignant Neoplasm Mortality Ratio: malignant neoplasm death rate for age group/general death rate for age group X 100.

(3) Chronic Disease Mortality Ratio: cardiovascular disease and malignant neoplasm death rates for age group/general death rate for age group X 100.

SOURCE: Tables B-34 through B-36.

TABLE B-4

Age Specific and Standardized General Death Rates (Per 1,000 Pop), Canada and Regions, by Gender, 1951 to 1981

	MALES								FEMALES							
	1951		1961		1971		1981		1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)
CANADA	20.2	(20.4)	19.7	(19.7)	19.8	(19.8)	18.0	(17.0)	16.4	(16.1)	14.3	(13.5)	14.0	(12.1)	13.3	(10.4)
35-44	3.2		2.8		2.9		2.2		2.5		1.6		1.7		1.2	
45-54	8.1		7.4		7.3		6.0		5.4		4.2		3.8		3.3	
55-64	19.9		18.9		18.2		15.4		12.9		10.1		8.9		7.8	
65-69	34.6		35.3		34.5		30.3		24.8		21.4		17.3		15.1	
70+	87.4		85.6		87.5		76.9		77.8		68.0		61.6		52.8	
ATLANTIC	20.1	(19.0)	19.9	(18.7)	21.8	(19.9)	20.3	(17.8)	18.0	(16.1)	16.2	(14.1)	15.7	(12.4)	14.5	(10.7)
35-44	3.2		2.6		3.0		2.5		2.4		1.8		1.8		1.1	
45-54	7.2		6.8		7.9		6.3		5.5		4.2		3.7		3.2	
55-64	17.0		17.6		18.1		16.3		12.5		10.1		9.0		8.1	
65-69	30.4		32.5		34.5		30.9		23.3		22.2		16.8		16.0	
70+	85.1		83.3		87.1		79.9		78.8		72.0		64.7		55.0	
QUEBEC	19.7	(22.4)	18.5	(21.1)	19.2	(21.0)	17.1	(17.5)	16.7	(18.5)	13.9	(15.1)	13.3	(12.8)	11.8	(10.0)
35-44	3.6		3.1		2.9		2.4		3.1		1.8		1.8		1.2	
45-54	9.2		8.0		8.0		6.3		6.3		4.6		3.9		3.2	
55-64	22.1		20.6		20.5		16.7		15.3		11.8		9.8		7.9	
65-69	38.8		39.2		38.0		32.6		29.6		24.4		18.9		15.5	
70+	94.1		89.8		89.7		76.5		86.7		75.0		64.8		49.4	
ONTARIO	20.8	(21.1)	20.1	(20.7)	19.4	(20.0)	18.0	(17.3)	17.2	(16.0)	15.0	(13.7)	14.1	(11.9)	14.0	(10.7)
35-44	3.1		2.7		2.7		1.9		2.3		1.6		1.6		1.2	
45-54	8.3		7.8		7.1		5.9		5.0		4.2		3.8		3.4	
55-64	21.2		20.1		18.7		15.5		12.8		9.9		8.9		8.0	
65-69	36.3		37.2		36.3		31.6		25.0		21.3		17.6		15.3	
70+	90.1		90.2		88.5		79.0		78.1		69.9		60.2		55.1	
PRAIRIES	18.6	(18.2)	19.3	(17.4)	19.9	(18.0)	18.6	(16.5)	13.9	(14.5)	12.2	(11.6)	13.4	(11.2)	13.4	(10.2)
35-44	2.7		2.4		2.9		2.4		2.1		1.5		1.5		1.4	
45-54	6.7		6.4		6.4		5.9		4.8		3.6		3.3		3.1	
55-64	16.8		15.7		14.9		13.9		11.0		8.2		7.7		7.3	

TABLE B-4
(continued)

	MALES								FEMALES							
	1951		1961		1971		1981		1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)
65-69	30.2		29.8		28.9		28.1		21.8		18.3		15.1		14.7	
70+	81.4		79.2		83.7		76.1		72.2		58.8		59.5		52.5	
BR. COLUMBIA	22.2	(19.5)	21.7	(18.4)	20.8	(19.1)	17.3	(15.4)	14.7	(13.0)	14.0	(12.0)	14.6	(11.8)	13.3	(10.0)
35-44	3.3		2.9		3.2		2.4		2.0		1.6		1.8		1.4	
45-54	8.1		7.0		7.3		5.7		5.6		3.9		4.2		3.5	
55-64	19.4		16.9		16.4		13.3		10.9		9.6		8.3		7.3	
65-69	34.6		32.8		30.4		24.6		20.3		18.5		16.0		13.6	
70+	80.7		80.4		87.3		71.0		64.6		58.9		59.9		51.0	

SOURCE: Canada: Table B-37; Regions: Table B-34. The unstandardized rates are obtained by taking the sum of the frequency of deaths, by gender, region and age, divided by the sum of the frequency of the population alive, by gender, region, and age, X 1,000. Standardized rates: the rates in each age group are multiplied by the standard population (i.e., the population alive in Canada in 1951, by corresponding age), then divided by the total standard population.

TABLE B-5

Female to Male Ratios (1) of General Death Rates (Per 100,000 pop) for Canada and Regions, Specific Ages, 1951-1981

	1951	1961	1971	1981
CANADA				
(35+)	81.1	72.4	70.4	73.8
35-44	77.4	59.4	58.3	56.4
45-54	66.6	56.0	51.3	54.8
55-64	64.9	53.7	48.8	50.8
65-69	71.6	60.5	50.1	49.9
70+	89.0	79.4	70.3	68.7
ATLANTIC				
(35+)	89.4	81.5	72.0	71.2
35-44	75.9	70.5	58.1	43.1
45-54	76.0	60.9	46.4	50.6
55-64	73.8	57.5	49.8	49.4
65-69	76.7	68.1	48.7	51.6
70+	92.6	86.4	74.4	68.9
QUEBEC				
(35+)	84.5	75.0	69.3	69.1
35-44	86.6	57.4	60.2	49.0
45-54	67.8	57.0	48.4	51.4
55-64	69.2	57.3	47.5	47.4
65-69	76.3	62.2	49.7	47.5
70+	92.2	83.5	72.3	64.5
ONTARIO				
(35+)	83.0	74.7	72.6	77.8
35-44	74.3	57.8	60.7	66.0
45-54	60.0	54.0	53.2	57.7
55-64	60.7	49.3	47.6	51.9
65-69	68.9	57.2	48.5	48.6
70+	86.7	77.4	68.0	69.8
PRAIRIES				
(35+)	74.7	63.3	67.1	71.9
35-44	77.5	60.9	52.1	58.0
45-54	72.1	55.8	51.2	52.8
55-64	65.5	52.1	51.8	52.7
65-69	72.4	61.5	52.1	52.4
70+	88.3	74.3	71.1	69.1
BRITISH COLUMBIA				
(35+)	66.5	64.6	70.0	76.8
35-44	60.5	56.4	56.3	57.6
45-54	69.2	54.8	57.4	61.0

TABLE B-5
(continued)

	1951	1961	1971	1981
55-64	56.2	56.8	50.6	54.7
65-69	58.7	56.3	52.7	55.2
70+	80.1	73.3	68.7	71.9

(1) Ratios determined by female general death rate (for age group) divided by male general death rate (for age group), x 100.

SOURCE: Table B-34.

TABLE B-6

Age Specific and Standardized Cardiovascular Disease Death Rates (Per 1,000 Pop), Canada and Regions, by Gender, 1951 to 1981

	MALES								FEMALES							
	1951		1961		1971		1981		1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)
CANADA	8.4	(8.5)	8.8	(8.8)	8.1	(8.1)	6.9	(6.5)	5.9	(5.8)	5.5	(5.2)	5.2	(4.3)	4.8	(2.6)
35-44	.9		.9		.7		.5		.4		.2		.2		.1	
45-54	3.2		3.4		2.9		2.1		1.2		.9		.7		.5	
55-64	8.8		8.8		7.9		6.0		4.2		3.3		2.4		1.9	
65-69	15.0		16.3		14.8		12.1		9.3		8.8		6.4		4.8	
70+	36.7		38.1		36.3		30.3		31.4		29.4		26.2		21.8	
ATLANTIC	7.4	(7.0)	8.6	(8.1)	9.3	(8.5)	8.1	(7.0)	5.9	(5.2)	5.9	(5.1)	5.8	(4.4)	5.6	(3.9)
35-44	.5		.7		.8		.6		.5		.3		.3		.1	
45-54	2.6		2.9		3.1		2.3		1.2		.9		.6		.6	
55-64	6.9		8.2		8.1		6.9		3.5		2.8		2.4		2.2	
65-69	12.4		14.6		15.4		12.8		8.6		8.6		6.6		5.5	
70+	31.6		35.8		37.9		31.9		27.7		29.2		26.4		23.8	
QUEBEC	7.6	(8.6)	8.1	(9.2)	7.8	(8.5)	6.4	(6.6)	5.5	(6.2)	5.3	(5.8)	4.8	(4.6)	4.2	(3.5)
35-44	1.0		1.0		.8		.6		.5		.2		.2		.1	
45-54	3.6		3.6		3.3		2.3		1.4		1.1		.8		.6	
55-64	9.3		9.8		8.8		6.3		4.6		4.0		2.9		2.2	
65-69	15.5		17.1		16.0		12.7		10.0		9.9		7.1		5.5	
70+	35.7		38.4		36.3		29.3		32.7		32.1		26.7		19.8	
ONTARIO	9.3	(9.5)	9.5	(9.8)	8.4	(8.6)	7.0	(6.7)	6.8	(6.3)	6.1	(5.5)	5.6	(4.6)	5.1	(3.7)
35-44	.9		.9		.7		.5		.4		.2		.1		.1	
45-54	3.6		3.8		3.0		2.2		1.2		1.0		.6		.5	
55-64	10.1		9.7		8.5		6.1		4.6		3.4		2.5		1.9	
65-69	16.6		18.3		16.2		12.8		10.3		9.3		6.8		4.8	
70+	40.5		42.4		38.4		31.4		33.8		31.4		27.7		23.3	
PRAIRIES	7.7	(7.5)	8.0	(7.2)	7.7	(6.9)	7.1	(6.3)	4.7	(5.0)	4.3	(4.0)	4.5	(3.7)	4.6	(3.3)
35-44	.7		.6		.6		.5		.4		.2		.1		.1	
45-54	2.4		2.6		2.4		2.0		.9		.7		.6		.4	

TABLE B-6
(continued)

	MALES								FEMALES							
	1951		1961		1971		1981		1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)
55-64	7.5		6.6		5.9		5.3		3.3		2.3		1.7		1.6	
65-69	13.2		12.9		11.5		11.1		8.0		7.0		5.3		4.3	
70+	34.3		33.4		33.1		30.3		27.8		23.1		23.0		20.7	
BR. COLUMBIA	9.4	(8.2)	9.7	(8.2)	8.0	(7.3)	6.4	(5.7)	5.8	(5.4)	5.8	(4.8)	5.0	(3.9)	4.5	(3.3)
35-44	.8		.8		.6		.4		.4		.2		.1		.1	
45-54	2.8		3.0		2.5		1.8		1.3		.8		.6		.4	
55-64	8.1		7.7		6.6		5.0		4.0		3.2		1.8		1.5	
65-69	15.2		15.3		12.4		9.5		7.8		7.6		4.8		3.6	
70+	36.4		36.7		34.7		27.7		29.0		27.5		24.5		20.9	

SOURCE: Canada: Tables B-29 and B-37; Regions: Table B-35.

TABLE B-7

Age Specific and Standardized Malignant Neoplasm Death Rates (Per 1,000 Pop), Canada and Regions, by Gender, 1951 to 1981

	MALES								FEMALES							
	1951		1961		1971		1981		1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)
CANADA	3.2	(3.2)	3.6	(3.6)	4.1	(4.1)	4.5	(4.3)	3.0	(3.0)	2.9	(2.8)	3.1	(2.8)	3.3	(2.8)
35-44	.4		.4		.5		.4		.8		.6		.6		.5	
45-54	1.4		1.4		1.5		1.6		1.9		1.7		1.6		1.6	
55-64	3.8		4.2		4.6		4.9		3.6		3.3		3.4		3.5	
65-69	6.7		7.9		9.0		9.0		5.4		5.1		5.0		5.5	
70+	11.8		14.0		16.0		17.1		9.4		9.1		9.2		9.2	
ATLANTIC	3.1	(3.0)	3.5	(3.4)	4.3	(3.9)	4.9	(4.4)	3.1	(2.9)	3.1	(2.9)	3.3	(2.8)	3.4	(2.7)
35-44	.4		.4		.5		.5		.5		.7		.7		.5	
45-54	1.4		1.3		1.8		1.8		1.7		1.8		1.7		1.5	
55-64	3.5		4.1		4.3		5.0		3.6		3.5		3.6		3.4	
65-69	6.6		7.0		9.0		9.1		5.1		5.3		4.6		5.3	
70+	10.4		12.8		14.3		16.8		10.0		8.7		9.1		8.8	
QUEBEC	3.2	(3.6)	3.7	(4.2)	4.4	(4.8)	4.7	(4.8)	3.2	(3.5)	3.0	(3.2)	3.3	(3.2)	3.2	(2.8)
35-44	.4		.4		.5		.4		1.0		.7		.7		.4	
45-54	1.5		1.5		1.9		1.7		2.1		1.8		1.7		1.5	
55-64	4.1		4.5		5.4		5.6		4.0		3.7		3.7		3.4	
65-69	8.1		9.7		10.4		10.4		6.6		5.8		5.4		5.5	
70+	13.7		16.7		18.4		18.6		11.1		11.3		11.3		9.5	
ONTARIO	3.2	(3.2)	3.5	(3.6)	3.9	(4.0)	4.5	(4.3)	3.1	(2.9)	2.9	(2.7)	3.0	(2.7)	3.5	(2.9)
35-44	.3		.4		.4		.4		.8		.6		.6		.5	
45-54	1.3		1.4		1.4		1.6		1.8		1.7		1.6		1.7	
55-64	4.0		4.4		4.6		4.9		3.7		3.2		3.3		3.7	
65-69	6.8		7.7		9.0		9.2		5.3		4.9		5.0		5.4	
70+	11.7		13.8		15.9		17.0		8.9		8.8		8.4		9.3	
PRAIRIES	3.0	(2.9)	3.5	(3.2)	4.1	(3.7)	4.3	(3.8)	2.7	(2.8)	2.5	(2.4)	2.8	(2.5)	3.3	(2.7)
35-44	.4		.3		.5		.3		.7		.5		.4		.5	
45-54	1.3		1.3		1.4		1.2		1.8		1.5		1.4		1.4	

TABLE B-7
(continued)

	MALES								FEMALES							
	1951		1961		1971		1981		1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)		(Std)
55-64	3.4		3.7		4.0		4.1		3.3		2.9		3.0		3.4	
65-69	5.6		6.8		7.9		7.6		4.7		4.8		4.6		5.7	
70+	11.4		12.6		14.9		16.4		8.5		7.7		8.3		9.0	
BR. COLUMBIA	3.4	(2.9)	3.9	(3.4)	4.1	(3.7)	4.3	(3.8)	2.9	(2.7)	2.8	(2.6)	3.2	(2.7)	3.4	(2.8)
35-44	.3		.4		.4		.4		.4		.7		.5		.5	
45-54	1.1		1.2		1.2		1.4		2.2		1.6		1.7		1.6	
55-64	3.6		3.6		4.2		4.0		3.4		3.1		3.1		3.3	
65-69	6.1		7.2		7.5		7.3		4.8		4.3		5.0		5.5	
70+	11.3		13.5		15.6		16.3		8.1		8.1		9.2		9.1	

SOURCE: Canada: Tables B-30 and B-37; Regions: Table B-36.

TABLE B-8

Female to Male Ratios(1) of Cardiovascular Disease Death Rates (Per 100,000 Pop) for Canada and Regions, Specific Ages, 1951-1981

	1951	1961	1971	1981
CANADA				
(35+)	70.6	63.1	63.3	68.8
35-44	51.2	24.4	22.9	23.5
45-54	37.9	27.4	22.6	23.8
55-64	47.6	37.4	30.2	31.8
65-69	62.3	54.2	43.4	40.0
70+	85.6	77.2	72.0	72.0
ATLANTIC				
(35+)	78.9	69.4	61.9	69.0
35-44	85.2	35.2	36.4	19.7
45-54	44.4	29.3	19.4	26.2
55-64	49.9	34.3	29.7	31.3
65-69	69.8	59.0	43.2	42.9
70+	87.8	81.6	69.7	74.6
QUEBEC				
(35+)	72.3	65.5	61.8	65.5
35-44	51.9	22.3	29.5	21.0
45-54	38.8	31.8	24.3	26.2
55-64	49.8	40.2	33.0	35.0
65-69	64.4	57.8	44.5	43.2
70+	91.7	83.6	73.4	67.7
ONTARIO				
(35+)	73.0	64.7	66.7	72.8
35-44	43.6	20.7	18.6	26.1
45-54	34.2	25.1	21.6	23.7
55-64	45.6	35.4	28.8	30.4
65-69	61.9	51.1	41.8	37.9
70+	83.5	74.0	72.1	74.4
PRAIRIES				
(35+)	61.3	53.4	59.0	63.7
35-44	53.9	30.0	17.0	21.7
45-54	38.5	25.7	23.3	18.9
55-64	44.0	34.3	29.1	30.1
65-69	60.2	54.2	46.6	38.4
70+	81.1	69.0	69.5	68.4
BRITISH COLUMBIA				
(35+)	62.1	59.8	62.5	70.8
35-44	46.8	30.3	17.7	38.9

TABLE B-8
(continued)

	1951	1961	1971	1981
45-54	44.8	24.8	22.2	22.8
55-64	49.9	41.7	27.8	30.5
65-69	51.1	49.3	38.6	38.3
70+	79.5	74.9	70.5	75.3

(1) Ratios determined by female cardiovascular disease death rate (for age group) divided by male cardiovascular disease death rate (for age group), x 100.

SOURCE: Table B-35.

TABLE B-9

Female to Male Ratios (1) of Malignant Neoplasm Death Rates (Per 100,000 Pop) for Canada and Regions, Specific Ages, 1951-1981

	1951	1961	1971	1981
CANADA				
(35+)	96.2	79.7	74.8	73.9
35-44	208.3	157.5	130.4	125.6
45-54	140.7	124.1	105.2	100.0
55-64	95.8	78.7	73.3	71.8
65-69	80.6	64.5	56.0	60.9
70+	79.3	64.7	57.2	53.9
ATLANTIC				
(35+)	101.3	87.7	77.8	68.0
35-44	132.5	173.2	143.8	106.1
45-54	119.4	144.8	93.8	86.0
55-64	101.1	85.9	83.5	67.7
65-69	77.9	76.3	51.7	58.9
70+	95.7	68.0	63.8	52.6
QUEBEC				
(35+)	101.6	82.6	75.2	67.5
35-44	256.8	157.1	130.8	100.0
45-54	136.4	119.6	93.6	87.9
55-64	98.3	81.3	69.4	60.7
65-69	80.9	59.7	51.7	52.8
70+	81.0	67.7	61.3	50.9
ONTARIO				
(35+)	97.5	81.5	76.1	77.1
35-44	220.6	155.0	146.5	145.7
45-54	137.6	123.9	113.6	104.3
55-64	91.0	72.7	73.0	74.8
65-69	77.2	63.5	56.3	58.3
70+	76.4	63.5	52.5	54.9
PRAIRIES				
(35+)	88.7	70.7	67.6	76.7
35-44	189.2	155.9	86.7	150.0
45-54	140.9	114.8	100.0	110.7
55-64	97.0	78.8	74.0	82.8
65-69	84.4	70.1	58.3	74.4
70+	75.4	61.1	55.6	55.1
BRITISH COLUMBIA				
(35+)	85.4	72.2	78.1	79.9
35-44	126.5	159.1	130.0	133.3

TABLE B-9
(continued)

	1951	1961	1971	1981
45-54	203.8	139.3	139.8	118.5
55-64	94.4	87.2	74.8	81.8
65-69	78.4	59.3	66.2	75.8
70+	71.4	59.8	59.1	55.8

(1) Ratios determined by female malignant neoplasm death rate (for age group) divided by male malignant neoplam death rate (for age group), x 100.

SOURCE: Table B-36.

TABLE B-10

Unstandardized and Standardized General Death Rates, by Marital Status, Both Sexes, 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
Single	20.7	(22.0)	20.2	(19.8)	22.2	(19.0)	22.5	(17.9)
Male	23.6	(25.5)	23.8	(24.6)	26.6	(25.4)	26.5	(24.7)
Female	17.3	(17.8)	16.1	(14.8)	17.4	(13.0)	18.3	(11.9)
Married	12.7	(16.0)	11.6	(14.6)	11.3	(13.8)	10.4	(11.6)
Male	15.4	(17.7)	15.2	(17.3)	15.4	(17.1)	14.1	(14.5)
Female	9.6	(13.6)	7.5	(10.8)	6.9	(9.3)	6.3	(7.7)
Widowed	52.6	(20.8)	51.6	(18.6)	51.1	(17.8)	46.3	(16.0)
Male	71.3	(27.9)	75.6	(26.3)	86.8	(29.9)	79.6	(28.9)
Female	44.9	(18.1)	43.3	(16.0)	42.1	(14.9)	39.4	(13.4)
Divorced	18.3	(30.4)	19.8	(29.4)	16.0	(20.5)	13.2	(17.8)
Male	29.9	(38.3)	32.0	(37.9)	24.3	(29.3)	20.6	(26.0)
Female	8.8	(18.2)	10.4	(20.1)	9.2	(12.4)	7.7	(11.1)
ATLANTIC								
Single	21.6	(21.8)	21.1	(20.1)	24.2	(19.6)	26.8	(19.4)
Male	22.5	(24.2)	22.6	(23.7)	26.1	(24.1)	30.5	(25.3)
Female	20.4	(18.8)	19.1	(15.9)	21.7	(14.4)	22.1	(12.9)
Married	12.4	(14.9)	11.7	(13.9)	12.3	(13.8)	11.3	(12.0)
Male	14.8	(16.1)	15.0	(16.1)	16.8	(17.2)	15.8	(15.3)
Female	9.6	(13.2)	7.9	(10.7)	7.3	(9.2)	6.4	(7.5)
Widowed	55.1	(20.2)	56.3	(19.7)	55.2	(18.6)	48.5	(16.5)
Male	71.1	(26.2)	76.2	(27.2)	89.5	(29.9)	80.2	(26.8)
Female	48.4	(17.8)	48.9	(17.1)	45.5	(15.5)	41.4	(14.3)
Divorced	16.8	(23.2)	21.0	(28.3)	14.4	(17.8)	14.0	(19.2)
Male	23.5	(26.4)	30.1	(32.6)	21.9	(23.7)	21.7	(26.8)
Female	10.7	(19.8)	12.9	(27.4)	7.6	(11.1)	7.7	(11.7)
QUEBEC								
Single	18.5	(23.7)	17.4	(20.2)	19.1	(18.0)	19.5	(16.3)
Male	22.2	(29.2)	21.7	(27.9)	24.1	(26.2)	23.8	(24.8)
Female	15.6	(19.6)	14.1	(15.2)	15.3	(12.7)	16.2	(11.1)
Married	13.2	(18.7)	11.6	(16.5)	11.4	(15.0)	10.2	(12.2)
Male	15.2	(19.8)	14.7	(18.9)	15.1	(18.2)	13.7	(15.1)
Female	10.9	(17.1)	8.2	(13.3)	7.2	(10.7)	6.4	(8.4)
Widowed	51.4	(21.5)	48.5	(19.2)	47.6	(17.9)	39.2	(14.8)
Male	66.8	(26.9)	66.3	(25.0)	81.0	(30.2)	72.8	(30.0)
Female	44.3	(19.1)	41.7	(17.0)	38.8	(14.8)	32.0	(11.7)
Divorced	13.4	(22.3)	12.2	(21.1)	25.9	(43.8)	9.9	(17.8)
Male	26.7	(31.0)	20.9	(30.5)	40.1	(65.1)	15.4	(23.7)
Female	4.1	(12.5)	6.3	(10.8)	14.5	(25.5)	5.8	(12.4)

TABLE B-10
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
ONTARIO								
Single	22.1	(21.5)	22.0	(19.8)	23.4	(19.0)	23.9	(18.4)
Male	24.2	(26.4)	24.2	(25.2)	26.4	(25.4)	26.3	(25.1)
Female	19.8	(16.9)	19.7	(14.7)	20.2	(13.5)	21.3	(12.8)
Married	12.9	(16.2)	11.7	(15.0)	11.1	(13.8)	10.4	(11.8)
Male	15.9	(18.3)	15.5	(18.2)	15.2	(17.4)	14.2	(14.8)
Female	9.4	(13.2)	7.4	(10.7)	6.6	(8.9)	6.3	(7.7)
Widowed	54.5	(21.1)	53.7	(19.2)	51.2	(17.9)	48.8	(16.5)
Male	76.0	(29.6)	82.0	(29.3)	88.8	(30.5)	82.5	(29.1)
Female	46.7	(18.3)	45.0	(16.2)	42.6	(15.1)	42.1	(14.0)
Divorced	17.5	(32.0)	21.1	(34.0)	13.3	(17.7)	14.3	(18.6)
Male	27.6	(40.5)	34.6	(46.4)	21.3	(28.1)	22.7	(28.2)
Female	10.4	(22.0)	11.8	(22.8)	7.5	(9.9)	8.6	(11.7)
PRAIRIES								
Single	18.3	(20.0)	20.0	(19.7)	22.9	(19.7)	24.3	(19.2)
Male	20.8	(21.2)	24.0	(22.1)	27.7	(23.9)	29.5	(24.5)
Female	12.2	(16.1)	11.4	(13.2)	13.7	(11.9)	15.7	(11.3)
Married	11.6	(14.3)	11.0	(12.8)	11.0	(12.6)	10.4	(11.1)
Male	14.2	(15.7)	14.8	(15.2)	15.1	(15.3)	14.2	(13.8)
Female	8.3	(11.9)	6.6	(9.0)	6.5	(8.5)	6.2	(7.3)
Widowed	50.7	(19.7)	48.7	(16.5)	51.8	(17.0)	49.4	(16.4)
Male	69.3	(26.9)	74.3	(22.1)	88.3	(28.7)	84.2	(29.0)
Female	42.3	(16.9)	39.4	(14.3)	42.4	(14.0)	42.2	(13.8)
Divorced	18.2	(31.1)	18.9	(28.0)	14.0	(16.8)	14.9	(18.4)
Male	30.4	(37.2)	28.8	(32.1)	20.1	(21.6)	24.3	(28.0)
Female	6.1	(16.4)	9.4	(23.4)	8.6	(11.6)	7.2	(9.3)
B.C.								
Single	26.0	(22.9)	23.4	(19.4)	26.7	(21.4)	22.0	(18.0)
Male	31.0	(26.0)	28.9	(23.1)	32.8	(27.5)	25.7	(23.6)
Female	15.5	(15.2)	14.0	(12.5)	17.5	(12.7)	16.9	(11.2)
Married	13.1	(14.5)	12.2	(13.4)	11.7	(13.2)	10.1	(10.5)
Male	16.6	(16.6)	16.4	(16.1)	15.8	(16.3)	13.5	(12.9)
Female	8.9	(11.2)	7.6	(9.6)	7.2	(8.9)	6.3	(7.1)
Widowed	48.4	(20.4)	51.4	(17.5)	53.5	(18.0)	47.7	(15.8)
Male	71.0	(30.2)	80.1	(26.1)	89.4	(28.8)	79.0	(26.3)
Female	39.4	(17.1)	41.7	(14.8)	44.7	(15.4)	41.1	(13.6)
Divorced	21.8	(32.6)	21.5	(27.7)	16.9	(19.2)	14.2	(16.4)
Male	35.5	(41.8)	35.6	(37.4)	24.5	(26.5)	20.8	(23.2)
Female	9.6	(16.6)	9.5	(16.2)	10.3	(11.8)	9.2	(11.0)

SOURCE: Unstandardized rates calculated by: sum of frequency of cardiovascular disease mortality by marital

TABLE B-10
(continued)

status and sex, divided by sum of population alive, X 1,000. Standardized rates from Tables B-31 and B-34.

TABLE B-11

The Amounts that the Unstandardized and Standardized General Death Rates are Less for Those Married Vs. Unmarried, 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
S-M(1)	8.0	(5.9)	8.6	(5.2)	10.8	(5.2)	12.1	(6.3)
W-M(2)	39.9	(4.8)	40.0	(4.0)	39.7	(4.0)	35.9	(4.4)
D-M(3)	5.6	(14.4)	8.2	(14.8)	4.6	(6.7)	2.8	(6.2)
ATLANTIC								
S-M	9.2	(6.8)	9.4	(6.2)	11.8	(5.8)	15.4	(7.4)
W-M	42.7	(5.3)	44.6	(5.9)	42.8	(4.8)	37.1	(4.5)
D-M	4.4	(8.3)	9.3	(14.4)	2.0	(4.1)	2.7	(7.2)
QUEBEC								
S-M	5.2	(5.0)	5.8	(3.7)	7.7	(3.0)	9.3	(4.1)
W-M	38.1	(2.9)	36.9	(2.7)	36.3	(2.9)	29.7	(2.6)
D-M	.1	(3.6)	.6	(4.6)	14.6	(28.8)	-.3	(5.5)
ONTARIO								
S-M	9.2	(5.3)	10.4	(4.8)	12.3	(5.2)	13.4	(6.7)
W-M	41.6	(5.0)	42.0	(4.2)	40.1	(4.1)	38.4	(4.8)
D-M	4.7	(15.8)	9.4	(19.0)	2.2	(3.9)	3.8	(6.8)
PRAIRIES								
S-M	6.8	(5.8)	9.0	(6.9)	11.8	(7.2)	13.9	(8.1)
W-M	39.2	(5.4)	37.7	(3.7)	40.8	(4.4)	39.0	(5.3)
D-M	6.6	(16.8)	8.0	(15.2)	3.0	(4.2)	4.5	(7.3)
B.C.								
S-M	12.9	(8.4)	11.2	(6.0)	15.0	(8.2)	11.9	(7.5)
W-M	35.3	(5.9)	39.1	(4.0)	41.8	(4.8)	37.6	(5.3)
D-M	8.7	(18.2)	9.2	(14.3)	5.2	(6.0)	4.1	(5.9)

(1) S-M = Single-Married.
(2) W-M = Widowed-Married.
(3) D-M = Divorced-Married.

SOURCE: Table B-10.

TABLE B-12

A Comparison of General Mortality Death Rates (Unstandardized and Standardized) Between Married and Unmarried Men and Women 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
Males								
S-M(1)	8.2	(7.8)	8.6	(7.2)	11.2	(8.3)	12.4	(10.2)
W-M(2)	55.9	(10.2)	60.4	(9.0)	71.5	(12.9)	65.5	(14.3)
D-M(3)	14.6	(20.6)	16.8	(20.5)	9.0	(12.2)	6.5	(11.5)
Females								
S-M	7.7	(4.2)	8.6	(4.0)	10.5	(3.7)	12.0	(4.2)
W-M	35.3	(4.5)	35.8	(5.2)	35.3	(5.6)	33.1	(5.7)
D-M	-.7	(4.6)	2.8	(9.3)	2.3	(3.1)	1.3	(3.4)
ATLANTIC								
Males								
S-M	7.7	(8.1)	7.6	(7.6)	9.3	(7.0)	14.8	(10.0)
W-M	56.3	(10.1)	61.2	(11.2)	72.7	(12.7)	64.4	(11.5)
D-M	8.7	(10.4)	15.1	(16.5)	5.1	(6.5)	5.9	(11.5)
Females								
S-M	10.8	(5.6)	11.2	(5.2)	14.4	(5.3)	15.7	(5.4)
W-M	38.8	(4.6)	41.0	(6.4)	38.2	(6.3)	35.0	(6.8)
D-M	1.1	(6.5)	5.0	(16.8)	.3	(1.9)	1.3	(4.3)
QUEBEC								
Males								
S-M	7.0	(9.4)	7.0	(9.0)	9.0	(8.0)	10.2	(9.6)
W-M	51.5	(7.1)	51.5	(6.1)	65.9	(12.0)	59.1	(14.9)
D-M	11.4	(11.2)	6.1	(11.6)	25.0	(46.9)	1.8	(8.5)
Females								
S-M	4.7	(2.5)	5.9	(1.9)	8.0	(4.6)	9.8	(2.7)
W-M	33.4	(2.0)	33.5	(3.7)	31.6	(4.1)	25.7	(3.2)
D-M	-6.8	(-4.7)	-1.8	(-2.6)	7.3	(14.8)	-.6	(4.0)
ONTARIO								
Males								
S-M	8.3	(8.1)	8.7	(6.9)	11.2	(8.0)	12.2	(10.3)
W-M	60.1	(11.3)	66.5	(11.1)	73.7	(13.1)	68.3	(14.3)
D-M	11.7	(22.2)	19.2	(28.1)	6.1	(10.7)	8.5	(13.4)
Females								
S-M	10.4	(3.7)	12.3	(4.1)	13.6	(4.5)	15.0	(5.2)
W-M	37.2	(5.1)	37.6	(5.5)	35.9	(6.2)	35.8	)(6.4)
D-M	1.0	(8.8)	4.4	(12.1)	.9	(1.0)	2.3	(4.0)

TABLE B-12
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
PRAIRIES								
Males								
S-M	6.6	(5.5)	9.2	(6.9)	12.6	(8.6)	15.3	(10.7)
W-M	55.1	(11.2)	59.5	(6.9)	73.2	(13.4)	70.0	(15.3)
D-M	16.1	(21.5)	14.0	(16.9)	5.1	(6.2)	10.2	(14.2)
Females								
S-M	3.8	(4.2)	4.9	(4.2)	7.2	(3.4)	9.5	(4.0)
W-M	34.0	(4.9)	32.8	(5.3)	35.9	(5.5)	36.0	(6.5)
D-M	-2.2	(4.4)	2.9	(14.4)	2.1	(3.1)	1.0	(2.0)
B.C.								
Males								
S-M	14.4	(9.4)	12.5	(7.0)	17.0	(11.2)	12.2	(10.6)
W-M	54.4	(13.6)	63.7	(10.1)	73.6	(12.5)	65.6	(13.4)
D-M	18.9	(25.2)	19.2	(21.4)	8.6	(10.2)	7.4	(10.3)
Females								
S-M	6.6	(4.0)	6.4	(2.9)	10.4	(3.9)	10.5	(4.1)
W-M	30.5	(5.9)	34.2	(5.2)	37.5	(6.7)	34.7	(6.5)
D-M	.8	(5.5)	2.0	(6.6)	3.1	(3.0)	2.9	(3.9)

(1) S-M = Single-Married.
(2) W-M = Widowed-Married.
(3) D-M = Divorced-Married.

SOURCE: Table B-10.

TABLE B-13

The Difference Between the Unstandardized and Standardized General Death Rates of Unmarried Men and Married Men Vs. Unmarried Women and Married Women, 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
(S-M)m-(S-M)f	.5	(3.6)	-.1	(3.3)	.7	(4.6)	.4	(6.0)
(W-M)m-(W-M)f	20.6	(5.7)	24.6	(3.8)	36.2	(7.3)	32.4	(8.7)
(D-M)m-(D-M)f	15.3	(16.0)	13.9	(11.2)	6.7	(9.1)	5.2	(8.1)
(U-M)m-(U-M)f	36.4	(25.4)	38.4	(18.2)	43.6	(21.0)	38.1	(22.8)
ATLANTIC								
(S-M)m-(S-M)f	-3.1	(2.5)	-3.6	(2.4)	-5.1	(1.7)	-.9	(4.6)
(W-M)m-(W-M)f	17.5	(5.6)	20.2	(4.7)	34.5	(6.4)	29.4	(4.7)
(D-M)m-(D-M)f	7.6	(3.8)	10.1	(-.2)	4.8	(4.6)	4.7	(7.3)
(U-M)m-(U-M)f	22.0	(11.9)	26.7	(6.9)	34.2	(12.7)	33.2	(16.5)
QUEBEC								
(S-M)m-(S-M)f	2.3	(6.9)	1.1	(7.1)	1.0	(3.4)	.4	(6.9)
(W-M)m-(W-M)f	18.1	(5.1)	18.0	(2.4)	34.3	(7.9)	33.5	(11.6)
(D-M)m-(D-M)f	18.3	(15.8)	8.0	(14.2)	17.7	(32.1)	2.4	(4.5)
(U-M)m-(U-M)f	38.7	(27.8)	27.1	(23.6)	53.0	(43.5)	36.2	(23.1)
ONTARIO								
(S-M)m-(S-M)f	-2.0	(4.4)	-3.6	(2.9)	-2.4	(3.5)	-2.8	(5.1)
(W-M)m-(W-M)f	22.9	(6.2)	28.9	(5.5)	37.7	(7.0)	32.5	(7.9)
(D-M)m-(D-M)f	10.7	(13.4)	14.7	(16.0)	5.2	(9.7)	6.2	(9.4)
(U-M)m-(U-M)f	31.6	(23.9)	40.1	(24.4)	40.6	(20.1)	35.9	(22.3)
PRAIRIES								
(S-M)m-(S-M)f	2.7	(1.3)	4.3	(2.8)	5.4	(5.2)	5.8	(6.7)
(W-M)m-(W-M)f	21.1	(6.3)	26.7	(1.6)	37.2	(7.8)	34.0	(8.8)
(D-M)m-(D-M)f	18.3	(17.1)	11.1	(2.5)	3.0	(3.1)	9.2	(12.2)
(U-M)m-(U-M)f	42.1	(24.7)	42.2	(6.9)	45.6	(16.2)	49.0	(27.8)
B.C.								
(S-M)m-(S-M)f	7.8	(5.4)	6.0	(4.1)	6.6	(7.4)	1.7	(6.6)
(W-M)m-(W-M)f	23.9	(7.7)	29.5	(4.9)	36.1	(6.0)	30.8	(6.9)

TABLE B-13
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
(D-M)m-(D-M)f	18.1	(19.8)	17.3	(14.8)	5.5	(7.3)	4.5	(6.4)
(U-M)m-(U-M)f	49.8	(32.8)	52.8	(23.8)	48.2	(20.7)	37.0	(19.9)

SOURCE: Table B-12.

TABLE B-14

Unstandardized and Standardized Death Rates Due to Cardiovascular Disease, by Marital Status, Both Sexes, 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
Single	7.6	(8.1)	8.0	(7.9)	8.1	(6.8)	8.0	(6.1)
Male	9.0	(9.8)	9.9	(10.2)	10.1	(9.6)	9.5	(8.8)
Female	5.9	(6.0)	5.9	(5.3)	5.9	(4.1)	6.4	(3.7)
Married	5.0	(6.4)	4.9	(6.3)	4.4	(5.4)	3.8	(4.3)
Male	6.5	(7.5)	6.9	(7.9)	6.4	(7.1)	5.5	(5.7)
Female	3.1	(4.8)	2.6	(4.0)	2.2	(3.2)	1.9	(2.5)
Widowed	21.3	(7.9)	22.2	(7.3)	21.2	(6.6)	18.4	(5.4)
Male	29.7	(11.0)	32.9	(10.9)	36.3	(12.1)	30.9	(10.0)
Female	17.9	(6.7)	18.5	(6.1)	17.5	(5.2)	15.8	(4.5)
Divorced	7.6	(13.9)	7.4	(11.6)	5.3	(7.3)	3.9	(5.7)
Male	13.5	(17.6)	12.6	(15.4)	9.1	(11.2)	6.7	(8.5)
Female	2.9	(7.4)	3.2	(6.9)	2.3	(3.7)	1.8	(3.2)
ATLANTIC								
Single	7.3	(7.4)	8.2	(7.8)	9.2	(7.3)	10.6	(7.4)
Male	7.9	(8.6)	9.3	(9.8)	10.5	(9.6)	12.2	(9.9)
Female	6.6	(5.9)	6.7	(5.4)	7.5	(4.6)	8.6	(4.5)
Married	4.3	(5.2)	4.8	(5.7)	4.9	(5.6)	4.3	(4.6)
Male	5.4	(5.9)	6.7	(7.1)	7.2	(7.3)	6.3	(6.1)
Female	2.9	(4.2)	2.6	(3.7)	2.3	(3.1)	2.1	(2.6)
Widowed	20.0	(6.9)	22.6	(7.3)	22.9	(7.0)	19.9	(5.9)
Male	27.6	(10.1)	31.3	(11.0)	39.2	(12.6)	31.6	(9.3)
Female	16.8	(5.6)	19.4	(6.0)	18.3	(5.4)	17.3	(5.2)
Divorced	4.7	(6.4)	8.1	(10.5)	6.2	(7.7)	4.6	(6.8)
Male	7.1	(7.6)	9.3	(10.1)	9.1	(9.7)	7.3	(9.5)
Female	2.5	(6.0)	5.8	(20.0)	3.5	(5.7)	2.4	(4.2)
QUEBEC								
Single	6.3	(8.4)	6.7	(8.0)	6.9	(6.5)	6.7	(5.4)
Male	8.2	(11.1)	9.0	(11.8)	9.3	(10.2)	8.3	(8.6)
Female	4.9	(6.4)	5.0	(5.5)	5.0	(4.1)	5.5	(3.4)
Married	4.8	(6.8)	4.8	(6.9)	4.4	(5.9)	3.7	(4.6)
Male	6.0	(7.7)	6.5	(8.4)	6.2	(7.4)	5.2	(5.8)
Female	3.3	(5.7)	2.8	(5.0)	2.4	(3.8)	2.1	(3.0)
Widowed	19.0	(7.6)	20.6	(7.6)	19.4	(6.7)	15.1	(5.0)
Male	25.1	(10.0)	28.0	(10.3)	33.2	(12.4)	27.2	(9.7)
Female	16.2	(6.5)	17.7	(6.6)	15.7	(5.3)	12.5	(4.0)
Divorced	4.8	(8.4)	3.3	(6.9)	8.7	(15.5)	2.8	(5.2)
Male	11.6	(14.0)	7.0	(10.4)	14.5	(23.4)	4.7	(7.3)
Female	-	(-)	.8	(3.1)	4.0	(8.8)	1.3	(3.4)

TABLE B-14
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
ONTARIO								
Single	8.6	(8.3)	9.1	(8.1)	9.1	(7.1)	8.7	(6.4)
Male	9.6	(10.6)	10.4	(10.8)	10.6	(10.2)	9.4	(8.9)
Female	7.5	(6.2)	7.7	(5.5)	7.6	(4.5)	7.9	(4.2)
Married	5.5	(7.0)	5.2	(6.9)	4.5	(5.6)	3.8	(4.4)
Male	7.3	(8.4)	7.5	(8.8)	6.6	(7.5)	5.6	(5.9)
Female	3.3	(5.0)	2.7	(4.2)	2.1	(3.2)	1.8	(2.4)
Widowed	23.8	(8.7)	24.1	(8.0)	22.7	(6.9)	19.9	(5.8)
Male	33.8	(12.5)	37.5	(12.8)	38.9	(13.1)	32.4	(10.9)
Female	20.2	(7.3)	19.9	(6.5)	19.0	(5.5)	17.4	(4.8)
Divorced	7.4	(14.2)	8.0	(13.9)	4.5	(6.4)	4.3	(5.8)
Male	13.1	(19.2)	14.4	(20.3)	8.4	(11.6)	7.7	(9.3)
Female	3.4	(8.4)	3.7	(7.8)	1.6	(2.5)	2.1	(3.4)
PRAIRIES								
Single	6.8	(7.5)	7.6	(7.5)	7.8	(6.6)	8.3	(6.3)
Male	8.2	(8.3)	9.6	(8.8)	10.1	(8.5)	10.6	(8.5)
Female	3.5	(4.8)	3.5	(4.2)	3.6	(3.0)	4.6	(2.9)
Married	4.4	(5.5)	4.3	(5.1)	4.0	(4.7)	3.7	(4.0)
Male	6.0	(6.6)	6.3	(6.5)	5.9	(6.0)	5.5	(5.3)
Female	2.6	(4.0)	2.0	(3.0)	1.9	(2.8)	1.7	(2.2)
Widowed	20.2	(7.4)	19.1	(5.8)	19.7	(5.7)	19.2	(5.1)
Male	29.3	(10.6)	29.9	(8.3)	34.1	(10.3)	34.0	(9.8)
Female	16.0	(6.1)	15.2	(4.8)	16.0	(4.5)	16.2	(4.2)
Divorced	7.7	(14.3)	6.6	(10.5)	4.3	(5.4)	4.4	(5.7)
Male	14.0	(17.7)	10.0	(11.5)	7.1	(7.8)	8.0	(9.3)
Female	1.5	(7.1)	3.3	(9.7)	1.8	(2.8)	1.4	(2.3)
B.C.								
Single	9.3	(7.9)	9.5	(7.7)	8.5	(6.3)	7.4	(5.6)
Male	11.3	(9.2)	11.8	(9.3)	10.6	(8.4)	8.5	(7.7)
Female	5.0	(4.9)	5.5	(4.8)	5.2	(3.4)	5.7	(3.3)
Married	5.5	(6.1)	5.2	(5.8)	4.3	(4.9)	3.5	(3.7)
Male	7.3	(7.3)	7.4	(7.3)	6.3	(6.4)	5.1	(4.9)
Female	3.2	(4.3)	2.7	(3.6)	2.0	(2.8)	1.7	(2.0)
Widowed	21.1	(7.8)	23.6	(6.8)	21.0	(5.9)	18.7	(5.1)
Male	30.9	(10.6)	36.5	(9.9)	35.4	(10.0)	29.7	(8.4)
Female	17.2	(6.7)	19.3	(5.8)	17.5	(5.0)	16.4	(4.5)
Divorced	9.7	(15.3)	8.7	(11.6)	5.6	(6.8)	4.0	(4.8)
Male	15.6	(19.0)	15.4	(16.3)	8.8	(9.6)	6.5	(7.4)
Female	4.5	(7.9)	3.1	(4.6)	2.9	(4.0)	2.1	(2.7)

SOURCE: Unstandardized rates calculated by: sum of frequency of cardiovascular disease mortality by marital

TABLE B-14
(continued)

status and sex, divided by sum of population alive, X 1,000. Standardized rates from Tables B-32 and B-35.

TABLE B-15

A Comparison of Cardiovascular Disease Mortality ~~Death~~ Rates (Unstandardized and Standardized) Between Married and Unmarried Men and Women 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
Males								
S-M [1]	2.4	(2.3)	2.9	(2.3)	3.7	(2.5)	4.0	(3.1)
W-M [2]	23.2	(3.5)	25.9	(3.0)	29.9	(5.0)	25.4	(4.3)
D-M [3]	6.9	(10.1)	5.7	(7.5)	2.7	(4.1)	1.2	(2.8)
Females								
S-M	2.7	(1.3)	3.3	(1.3)	3.8	(.9)	4.5	(1.3)
W-M	14.7	(1.9)	15.9	(2.1)	15.3	(2.0)	14.0	(2.1)
D-M	-.2	(2.7)	.6	(-.4)	.2	(.5)	-.1	(.8)
ATLANTIC								
Males								
S-M	2.4	(2.7)	2.7	(2.7)	3.3	(2.3)	5.9	(3.8)
W-M	22.2	(4.2)	24.7	(3.9)	32.0	(5.3)	25.3	(3.2)
D-M	1.7	(1.7)	2.6	(3.0)	1.9	(2.4)	1.0	(3.4)
Females								
S-M	3.7	(1.8)	4.1	(1.7)	5.2	(1.5)	6.6	(1.9)
W-M	13.9	(1.4)	16.8	(2.3)	15.9	(2.3)	15.2	(2.6)
D-M	-.4	(1.8)	3.2	(16.3)	1.2	(2.6)	.3	(1.7)
QUEBEC								
Males								
S-M	2.2	(3.4)	2.5	(3.4)	3.2	(2.8)	3.0	(2.8)
W-M	19.1	(2.3)	21.5	(2.0)	27.0	(4.9)	22.0	(3.9)
D-M	5.6	(6.2)	.4	(2.0)	8.3	(15.9)	-.5	(1.5)
Females								
S-M	1.6	(.7)	2.2	(.4)	2.7	(.8)	3.4	(.5)
W-M	12.9	(.8)	14.9	(1.6)	13.4	(1.5)	10.4	(1.0)
D-M	-3.3	(-5.7)	-2.0	(-1.9)	1.7	(5.1)	-.8	(.4)
ONTARIO								
Males								
S-M	2.3	(2.2)	2.9	(2.0)	4.0	(2.6)	3.8	(3.0)
W-M	26.5	(4.1)	30.0	(4.0)	32.4	(5.6)	26.7	(5.0)
D-M	5.8	(10.8)	6.9	(11.5)	1.8	(4.1)	2.1	(3.4)
Females								
S-M	4.1	(1.2)	5.0	(1.3)	5.5	(1.3)	6.1	(1.8)
W-M	16.8	(2.4)	17.2	(2.3)	16.9	(2.4)	15.6	(2.4)
D-M	.0	(3.4)	11.7	(3.6)	-.5	(-.7)	.3	(1.0)
PRAIRIES								

TABLE B-15
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
Males								
S-M	2.2	(1.8)	3.3	(2.3)	4.2	(2.5)	5.1	(3.2)
W-M	23.3	(4.0)	23.6	(1.8)	28.2	(4.3)	28.5	(4.5)
D-M	8.1	(11.1)	3.7	(5.1)	1.2	(1.8)	2.5	(4.0)
Females								
S-M	.9	(.9)	1.5	(1.2)	1.7	(.2)	2.9	(.7)
W-M	13.5	(2.1)	13.2	(1.9)	14.1	(1.8)	14.4	(2.0)
D-M	-1.0	(3.2)	1.3	(6.7)	-.2	(.0)	-.3	(.1)
B.C.								
Males								
S-M	4.0	(1.9)	4.4	(2.0)	4.3	(2.0)	3.4	(2.8)
W-M	23.6	(3.4)	29.1	(2.6)	29.1	(3.5)	24.5	(3.5)
D-M	8.3	(11.8)	8.0	(9.1)	2.5	(3.1)	1.4	(2.5)
Females								
S-M	1.8	(.6)	2.8	(1.2)	3.2	(.6)	4.1	(1.3)
W-M	14.0	(2.4)	16.6	(2.2)	15.5	(2.2)	14.8	(2.5)
D-M	1.3	(3.6)	.4	(1.0)	.9	(1.2)	.5	(.8)

[1] S-M = Single-Married.
[2] W-M = Widowed-Married.
[3] D-M = Divorced-Married.

SOURCE: Table B-14.

TABLE B-16

The Difference Between the Unstandardized and Standardized Cardiovascular Disease Death Rates of Unmarried Men and Married Men Vs. Unmarried Women and Married Women, 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
(S-M)m-(S-M)f	-.3	(1.0)	-.4	(1.0)	.0	(1.6)	-.6	(1.8)
(W-M)m-(W-M)f	8.4	(1.6)	10.1	(.9)	14.6	(2.9)	11.4	(2.3)
(D-M)m-(D-M)f	7.2	(7.4)	5.1	(5.0)	2.5	(3.5)	1.3	(2.1)
(U-M)m-(U-M)f	15.3	(10.0)	14.8	(6.9)	17.1	(8.1)	12.2	(6.2)
ATLANTIC								
(S-M)m-(S-M)f	-1.3	(.9)	-1.5	(1.0)	-1.9	(.7)	-.6	(2.0)
(W-M)m-(W-M)f	8.3	(2.7)	7.9	(1.6)	16.1	(3.0)	10.0	(.6)
(D-M)m-(D-M)f	2.0	(-.1)	-.6	(-13.3)	.7	(-.2)	.7	(1.7)
(U-M)m-(U-M)f	9.1	(3.5)	5.9	(-10.7)	14.9	(3.5)	10.1	(4.3)
QUEBEC								
(S-M)m-(S-M)f	.6	(2.7)	.3	(3.0)	.5	(2.5)	-.4	(2.3)
(W-M)m-(W-M)f	6.3	(1.5)	6.6	(.4)	13.6	(3.4)	11.6	(2.9)
(D-M)m-(D-M)f	8.9	(11.9)	2.4	(3.9)	6.6	(10.9)	.3	(1.0)
(U-M)m-(U-M)f	15.8	(16.1)	9.4	(7.3)	20.7	(16.8)	11.5	(6.3)
ONTARIO								
(S-M)m-(S-M)f	-1.8	(.9)	-2.1	(.7)	-1.4	(1.3)	-2.3	(1.2)
(W-M)m-(W-M)f	9.7	(1.8)	12.8	(1.7)	15.5	(3.2)	11.2	(2.6)
(D-M)m-(D-M)f	5.8	(7.3)	-4.8	(7.9)	2.4	(4.8)	1.8	(2.4)
(U-M)m-(U-M)f	13.7	(10.0)	6.0	(10.3)	16.4	(9.3)	10.7	(6.2)
PRAIRIES								
(S-M)m-(S-M)f	1.3	(.9)	1.8	(1.1)	2.5	(2.3)	2.3	(2.5)
(W-M)m-(W-M)f	9.9	(1.9)	10.4	(-.0)	14.1	(2.5)	14.1	(2.6)
(D-M)m-(D-M)f	9.1	(8.0)	2.5	(-1.6)	1.4	(1.7)	2.9	(3.9)
(U-M)m-(U-M)f	20.2	(10.8)	14.7	(-.6)	17.9	(6.6)	19.2	(8.9)
B.C.								
(S-M)m-(S-M)f	2.3	(1.3)	1.6	(.8)	1.2	(1.4)	-.7	(1.5)
(W-M)m-(W-M)f	9.6	(.9)	12.5	(.5)	13.6	(1.3)	9.8	(1.0)

TABLE B-16
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
(D-M)m-(D-M)f	7.0	(8.2)	7.5	(8.0)	1.6	(1.9)	.9	(1.7)
(U-M)m-(U-M)f	18.8	(10.4)	21.6	(9.3)	16.4	(4.7)	10.1	(4.2)

SOURCE: Table B-15.

TABLE B-17

Unstandardized and Standardized Malignant Neoplasm Death Rates, by Marital Status, Both Sexes, 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
Single	3.2	(3.4)	3.6	(3.6)	4.3	(3.7)	4.9	(4.0)
Male	3.1	(3.3)	3.7	(3.9)	4.5	(4.3)	5.4	(5.0)
Female	3.4	(3.6)	3.4	(3.2)	4.1	(3.3)	4.3	(3.2)
Married	2.5	(3.0)	2.5	(3.1)	2.8	(3.3)	3.1	(3.4)
Male	2.6	(3.0)	3.0	(3.4)	3.5	(3.9)	3.9	(4.0)
Female	2.3	(2.9)	2.0	(2.5)	2.1	(2.5)	2.3	(2.5)
Widowed	7.1	(3.5)	7.7	(3.5)	8.3	(3.6)	8.8	(3.9)
Male	9.6	(4.2)	11.7	(4.3)	14.3	(5.2)	15.7	(6.2)
Female	6.1	(2.4)	6.4	(3.1)	6.8	(3.2)	7.3	(3.4)
Divorced	3.3	(5.0)	4.0	(5.6)	3.4	(4.4)	3.4	(4.7)
Male	4.9	(6.1)	5.7	(6.7)	4.2	(5.1)	4.7	(6.1)
Female	1.9	(2.9)	2.6	(4.3)	2.9	(3.6)	2.5	(3.3)
ATLANTIC								
Single	3.2	(3.4)	3.5	(3.4)	4.4	(3.6)	5.2	(3.9)
Male	3.0	(3.2)	3.6	(3.8)	4.3	(3.9)	6.0	(4.9)
Female	3.5	(3.5)	3.4	(3.1)	4.5	(3.3)	4.1	(2.8)
Married	2.4	(2.7)	2.5	(2.9)	3.0	(3.3)	3.3	(3.4)
Male	2.6	(2.8)	2.9	(3.1)	3.7	(3.7)	4.3	(4.1)
Female	2.1	(2.6)	2.1	(2.5)	2.3	(2.6)	2.2	(2.4)
Widowed	7.4	(3.5)	8.0	(3.8)	8.2	(3.6)	8.5	(4.1)
Male	8.8	(4.2)	11.3	(4.8)	13.4	(4.7)	14.4	(4.7)
Female	6.9	(3.2)	6.8	(3.4)	6.7	(3.3)	7.2	(3.9)
Divorced	4.8	(5.3)	6.9	(8.0)	3.5	(4.3)	3.9	(5.0)
Male	5.1	(5.3)	9.3	(9.5)	4.6	(5.1)	5.2	(6.7)
Female	4.5	(4.7)	4.9	(4.2)	2.0	(2.5)	2.6	(3.0)
QUEBEC								
Single	3.0	(3.8)	3.4	(3.7)	4.1	(3.9)	4.7	(4.0)
Male	2.8	(3.7)	3.4	(4.5)	4.3	(4.7)	5.3	(5.6)
Female	3.2	(3.8)	3.5	(3.7)	4.0	(3.4)	4.2	(3.2)
Married	2.6	(3.5)	2.7	(3.6)	3.1	(3.8)	3.1	(3.6)
Male	2.7	(3.4)	3.1	(4.0)	3.8	(4.5)	4.0	(4.4)
Female	2.6	(3.6)	2.2	(3.0)	2.3	(2.9)	2.2	(2.6)
Widowed	7.6	(3.8)	8.4	(3.9)	9.0	(4.1)	8.6	(4.0)
Male	10.1	(4.5)	12.1	(4.8)	15.4	(6.1)	17.1	(7.7)
Female	6.4	(3.5)	6.9	(3.5)	7.3	(3.6)	6.8	(3.2)
Divorced	3.3	(5.1)	3.3	(5.1)	6.9	(10.9)	3.0	(5.2)
Male	4.6	(5.3)	5.2	(7.0)	9.0	(14.0)	4.3	(6.4)
Female	2.4	(5.0)	2.0	(3.0)	5.2	(8.2)	2.0	(4.1)

TABLE B-17
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
ONTARIO								
Single	3.5	(3.4)	3.8	(3.5)	4.3	(3.6)	5.0	(4.1)
Male	3.1	(3.4)	3.9	(4.1)	4.3	(4.2)	5.3	(5.0)
Female	3.8	(3.5)	3.8	(3.1)	4.2	(3.2)	4.7	(3.4)
Married	2.5	(2.9)	2.5	(3.0)	2.7	(3.2)	3.2	(3.4)
Male	2.6	(3.0)	2.9	(3.4)	3.4	(3.8)	3.9	(4.0)
Female	2.3	(2.8)	2.0	(2.5)	2.0	(2.4)	2.3	(2.6)
Widowed	7.0	(3.5)	7.6	(3.3)	8.1	(3.5)	8.9	(3.9)
Male	9.9	(4.5)	12.0	(4.4)	14.2	(5.0)	15.3	(5.8)
Female	6.0	(3.1)	6.2	(2.9)	6.6	(3.1)	7.6	(3.5)
Divorced	2.5	(4.4)	4.1	(5.9)	2.7	(3.5)	3.7	(4.9)
Male	3.7	(5.9)	5.9	(7.2)	3.4	(4.7)	5.1	(6.9)
Female	1.7	(1.9)	2.8	(4.8)	2.2	(2.6)	2.8	(3.4)
PRAIRIES								
Single	2.8	(3.0)	3.4	(3.4)	4.3	(3.8)	5.2	(4.1)
Male	2.8	(2.9)	3.8	(3.6)	4.8	(4.2)	5.5	(4.5)
Female	2.6	(3.2)	2.6	(2.8)	3.4	(3.0)	4.6	(3.6)
Married	2.4	(2.8)	2.4	(2.8)	2.7	(3.0)	3.0	(2.4)
Male	2.6	(2.8)	3.0	(3.1)	3.5	(3.5)	3.7	(3.6)
Female	2.1	(2.6)	1.8	(2.2)	1.9	(2.2)	2.1	(2.3)
Widowed	6.7	(3.0)	7.1	(3.0)	8.0	(3.2)	8.9	(3.8)
Male	8.8	(3.2)	11.0	(3.3)	14.1	(4.7)	14.7	(5.1)
Female	5.7	(2.8)	5.7	(2.8)	6.4	(2.8)	7.7	(3.6)
Divorced	4.7	(6.2)	3.5	(3.9)	2.9	(3.4)	3.3	(4.1)
Male	5.8	(6.4)	4.9	(5.4)	2.8	(2.9)	4.3	(5.3)
Female	3.0	(6.0)	2.1	(2.9)	3.0	(3.9)	2.4	(2.9)
B.C.								
Single	3.9	(3.4)	3.8	(3.2)	5.2	(4.2)	4.5	(3.7)
Male	4.1	(3.4)	4.2	(3.4)	5.7	(4.8)	5.1	(4.7)
Female	3.4	(3.6)	3.0	(2.8)	4.3	(3.2)	3.6	(2.7)
Married	2.4	(2.6)	2.7	(3.0)	2.8	(3.1)	3.1	(3.1)
Male	2.7	(2.7)	3.3	(3.3)	3.4	(3.5)	3.6	(3.5)
Female	2.1	(2.4)	2.0	(2.4)	2.1	(2.4)	2.5	(2.6)
Widowed	7.0	(3.7)	7.3	(3.5)	8.5	(3.4)	9.0	(3.8)
Male	9.6	(3.8)	11.0	(3.8)	13.4	(4.1)	16.6	(5.9)
Female	6.0	(3.5)	6.1	(3.3)	7.3	(3.2)	7.4	(3.3)
Divorced	3.4	(4.8)	3.8	(5.3)	3.1	(3.6)	3.5	(4.1)
Male	5.8	(6.5)	5.5	(6.0)	3.6	(4.1)	4.4	(5.0)
Female	1.3	(1.9)	2.3	(4.6)	2.6	(3.0)	2.8	(3.4)

SOURCE: Unstandardized rates calculated by: sum of frequency of malignant neoplasm mortality by marital

TABLE B-17
(continued)

status and sex, divided by sum of population alive, X 1,000. Standardized rates from Tables B-33 and B-36.

TABLE B-18

A Comparison of Malignant Neoplasm Mortality Death Rates (Unstandardized and Standardized) Between Married and Unmarried Men and Women 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
Males								
S-M (1)	.4	(.3)	.7	(.5)	1.0	(.5)	1.5	(1.1)
W-M (2)	7.0	(1.2)	8.7	(.9)	10.8	(1.3)	11.9	(2.2)
D-M (3)	2.3	(3.1)	2.7	(3.3)	.6	(1.2)	.8	(2.2)
Females								
S-M	1.1	(.7)	1.4	(.7)	2.0	(.8)	2.1	(.7)
W-M	3.9	(-.4)	4.4	(.6)	4.8	(.7)	5.1	(.9)
D-M	-.3	(.1)	.6	(1.7)	.8	(1.1)	.3	(.8)
ATLANTIC								
Males								
S-M	.4	(.5)	.8	(.8)	.6	(.2)	1.7	(.8)
W-M	6.2	(1.4)	8.5	(1.7)	9.7	(1.0)	10.2	(.6)
D-M	2.5	(2.5)	6.4	(6.4)	.9	(1.4)	1.0	(2.6)
Females								
S-M	1.4	(.9)	1.3	(.5)	2.2	(.7)	1.9	(.4)
W-M	4.8	(.6)	4.7	(.9)	4.4	(.7)	4.9	(1.4)
D-M	2.4	(2.1)	2.7	(1.7)	-.3	(-.1)	.4	(.6)
QUEBEC								
Males								
S-M	.1	(.2)	.3	(.5)	.5	(.3)	1.3	(1.2)
W-M	7.5	(1.0)	9.0	(.8)	11.6	(1.7)	13.1	(3.3)
D-M	2.0	(1.9)	2.1	(3.0)	5.2	(9.5)	.3	(2.0)
Females								
S-M	.6	(.3)	1.3	(.6)	1.7	(.5)	2.0	(.6)
W-M	3.8	(-.1)	4.8	(.5)	5.0	(.6)	4.6	(.6)
D-M	-.2	(1.4)	-.2	(-.1)	2.9	(5.3)	-.1	(1.6)
ONTARIO								
Males								
S-M	.5	(.4)	1.0	(.7)	1.0	(.3)	1.4	(1.0)
W-M	7.3	(1.5)	9.1	(1.0)	10.8	(1.2)	11.4	(1.8)
D-M	1.1	(2.9)	3.0	(3.9)	.0	(.9)	1.2	(2.9)
Females								
S-M	1.6	(.8)	1.8	(.7)	2.2	(.8)	2.4	(.8)
W-M	3.7	(.4)	4.3	(.5)	4.7	(.8)	5.3	(.9)
D-M	-.6	(-.8)	.8	(2.3)	.3	(.2)	.5	(.9)
PRAIRIES								

TABLE B-18
(continued)

	1951	(Std)	1961	(Std)	1971	(Std)	1981	(Std)
Males								
S-M	.2	(.1)	.8	(.5)	1.3	(.7)	1.8	(1.0)
W-M	6.2	(.4)	8.0	(.3)	10.6	(1.2)	11.1	(1.6)
D-M	3.2	(3.6)	1.9	(2.3)	-.7	(-.6)	.6	(1.7)
Females								
S-M	.6	(.6)	.8	(.6)	1.5	(.8)	2.5	(1.2)
W-M	3.7	(.2)	3.9	(.6)	4.5	(.6)	5.6	(1.2)
D-M	.9	(3.4)	.3	(.6)	1.1	(1.7)	.3	(.5)
B.C.								
Males								
S-M	1.4	(.7)	.9	(-.1)	2.3	(1.3)	1.5	(1.3)
W-M	6.9	(1.1)	7.7	(.6)	10.0	(.6)	12.9	(2.5)
D-M	3.1	(3.8)	2.2	(2.7)	.2	(.6)	.8	(1.6)
Females								
S-M	1.3	(1.1)	1.0	(.4)	2.2	(.9)	1.2	(.1)
W-M	3.9	(1.1)	4.1	(.9)	5.1	(.8)	4.9	(.7)
D-M	-.8	(-.5)	.3	(2.3)	.5	(.7)	.4	(.8)

(1) S-M = Single-Married.
(2) W-M = Widowed-Married.
(3) D-M = Divorced-Married.

SOURCE: Table B-17.

TABLE B-19

The Difference Between the Unstandardized and Standardized Malignant Neoplasm Death Rates of Unmarried Men and Married Men Vs. Unmarried Women and Married Women, 35+, Canada and Regions, 1951-1981

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
CANADA								
(S-M)m-(S-M)f	-.7	(-.4)	-.7	(-.2)	-1.0	(-.3)	-.6	(.4)
(W-M)m-(W-M)f	3.1	(1.6)	4.3	(.3)	6.0	(.6)	6.8	(1.3)
(D-M)m-(D-M)f	2.6	(3.0)	2.2	(1.6)	-.2	(.1)	.5	(1.4)
(U-M)m-(U-M)f	5.0	(4.3)	5.8	(1.7)	4.9	(.4)	6.7	(3.0)
ATLANTIC								
(S-M)m-(S-M)f	-1.1	(-.4)	-.5	(.2)	-1.6	(-.5)	-.1	(.5)
(W-M)m-(W-M)f	1.4	(.8)	3.8	(.8)	5.2	(.3)	5.2	(-.9)
(D-M)m-(D-M)f	.1	(.4)	3.7	(4.7)	1.1	(1.5)	.6	(2.0)
(U-M)m-(U-M)f	.4	(.8)	6.9	(5.8)	4.7	(1.4)	5.7	(1.6)
QUEBEC								
(S-M)m-(S-M)f	-.5	(-.0)	-1.0	(-.2)	-1.2	(-.3)	-.7	(.6)
(W-M)m-(W-M)f	3.7	(1.1)	4.3	(.3)	6.6	(1.0)	8.5	(2.7)
(D-M)m-(D-M)f	2.1	(.5)	2.3	(3.1)	2.3	(4.2)	.4	(.5)
(U-M)m-(U-M)f	5.4	(1.6)	5.5	(3.2)	7.7	(5.0)	8.3	(3.8)
ONTARIO								
(S-M)m-(S-M)f	-1.1	(-.4)	-.8	(.0)	-1.2	(-.5)	-1.0	(.2)
(W-M)m-(W-M)f	3.6	(1.2)	4.8	(.5)	6.1	(.4)	5.1	(.9)
(D-M)m-(D-M)f	1.6	(3.8)	2.2	(1.5)	-.2	(.7)	.8	(2.0)
(U-M)m-(U-M)f	4.1	(4.6)	6.3	(2.1)	4.7	(.6)	4.9	(3.1)
PRAIRIES								
(S-M)m-(S-M)f	-.3	(-.6)	.0	(-1)	-.2	(-.1)	-.7	(-.2)
(W-M)m-(W-M)f	2.6	(.2)	4.1	(-.3)	6.2	(.6)	5.5	(.3)
(D-M)m-(D-M)f	2.3	(.1)	1.6	(1.7)	.4	(1.2)	.4	(1.2)
(U-M)m-(U-M)f	4.6	(-.2)	5.7	(1.3)	6.3	(1.6)	5.2	(1.3)
B.C.								
(S-M)m-(S-M)f	.1	(-.5)	-.1	(-.3)	.2	(.5)	.3	(1.2)
(W-M)m-(W-M)f	3.0	(.0)	3.6	(-.3)	4.8	(-.2)	8.0	(1.7)

TABLE B-19
(continued)

	1951		1961		1971		1981	
		(Std)		(Std)		(Std)		(Std)
(D-M)m-(D-M)f	3.9	(4.4)	1.9	(.5)	-.3	(-.0)	.4	(.8)
(U-M)m-(U-M)f	7.0	(3.9)	5.5	(-.1)	4.7	(.3)	8.8	(3.8)

SOURCE: Table B-18.

TABLE B-20

Age Composition (Median Age) of Population 35+ by Year and Variable

	1951	1961	1971	1981
REGION				
Atlantic	53.7	53.8	55.0	55.5
Quebec	51.9	52.0	53.1	54.0
Ontario	53.4	53.2	53.9	54.9
Prairies	53.2	53.6	54.6	55.2
British Columbia	54.3	54.4	54.8	55.3
GENDER				
Males	53.1	53.0	53.4	53.9
Females	53.2	53.3	54.6	55.6
MARITAL STATUS				
Single	52.2	53.2	55.2	55.9
Married	51.1	51.0	51.7	52.6
Widowed	67.5	68.5	69.4	70.8
Divorced	48.7	50.2	50.7	50.2
Average, Per Year	53.1	53.1	54.0	54.8

SOURCES for this and other tables in Appendix C are from Census of Canada Tables: 1951 (Vol.II), Table 1; 1961 (Vol.I, pt.3, 92-552), Table 78; 1971 (Vol.I, pt.4, 92-729), Table 2; 1981 (Vol.I, 92-901), Table 5.

Median calculated by Σfmid/N.

TABLE B-21

Population 35+ by Year'¹' and Variable

	1951		1961		1971		1981		TOTAL	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
Total Population 35+	5,430,833	(100.0)	6,938,672	(100.0)	8,280,900	(100.0)	9,969,050	(100.0)	30,619,455	(100.0)
REGION										
Atlantic	574,226	(10.6)	672,745	(9.7)	739,435	(8.9)	856,520	(8.6)	2,842,926	(9.3)
Quebec	1,381,860	(25.4)	1,822,932	(26.3)	2,214,245	(26.7)	2,641,770	(26.5)	8,060,807	(26.3)
Ontario	1,951,901	(35.9)	2,522,018	(36.3)	3,061,650	(37.0)	3,683,630	(37.0)	11,219,199	(36.6)
Prairies	994,447	(18.3)	1,223,190	(17.6)	1,370,260	(16.5)	1,611,445	(16.2)	5,199,342	(17.0)
British Columbia	528,399	(9.7)	697,787	(10.1)	895,310	(10.8)	1,175,685	(11.8)	3,297,181	(10.8)
GENDER										
Males	2,781,085	(51.2)	3,472,098	(50.0)	4,046,610	(48.9)	4,784,820	(48.0)	15,084,613	(49.3)
Females	2,649,748	(48.8)	3,466,574	(50.0)	4,234,290	(51.1)	5,184,230	(52.0)	15,534,842	(50.7)
MARITAL STATUS'²'										
Single	654,689	(12.1)	727,011	(10.5)	749,080	(9.0)	765,645	(7.7)	2,896,425	(9.5)
Married	4,122,690	(75.9)	5,403,512	(77.9)	6,481,985	(78.3)	7,700,265	(77.2)	23,708,452	(77.4)
Widowed	629,520	(11.6)	766,523	(11.0)	923,570	(11.2)	1,142,675	(11.5)	3,462,288	(11.3)
Divorced	23,934	(0.4)	41,626	(0.6)	126,265	(1.5)	360,465	(3.6)	552,290	(1.8)
AGE										
35-44	1,864,475	(34.3)	2,385,138	(34.4)	2,520,630	(30.4)	2,960,105	(29.7)	9,730,348	(31.8)
45-54	1,405,314	(25.9)	1,875,579	(27.0)	2,287,695	(27.6)	2,493,690	(25.0)	8,062,278	(26.3)
55-64	1,075,668	(19.8)	1,287,870	(18.6)	1,729,495	(20.9)	2,156,240	(21.6)	6,249,273	(20.4)
65-69	433,139	(8.0)	486,662	(7.0)	619,385	(7.5)	843,520	(8.5)	2,382,706	(7.8)
70+	652,237	(12.0)	903,423	(13.0)	1,123,695	(13.6)	1,515,495	(15.2)	4,194,850	(13.7)

'¹'Population figures for 1951 and 1961 are identical to those published those years for Censal populations in these age groups. Due to the random, independent rounding which occured in the 1971 and 1981 Censuses, some over or underestimation occurs.

'²'In Censuses of 1971 and 1981, persons living in commonlaw unions were reported as married, regardless of their legal marital status. Distributions computed from these censuses are therefore based on de facto marital status (Peron and Strohmenger, 1985:60).

SOURCES: from Census of Canada Tables: 1951 (Vol.II), Table 1; 1961(Vol.I, pt.3, 92-552), Table 78; 1971 (Vol.I, pt.4), 92-729), Table 2; 1981 (Vol.I, 92-901), Table 5. Statistics calculated through SPSSx.

TABLE B-22

Cause of Death, Coded by International Classification of Diseases (ICD), by Year

Cause	1951 (ICD 6)	1961 (ICD 7)	1971 (ICD 8)	1981 (ICD 9)
1. ALL CAUSES	001-E999	001-E999	000-E999	001-E999
2. CARDIOVASCULAR DISEASE	401,402.1,410-416, 420-422,430-434 440-443,446	same as ICD 6	393-398,400.1,400.5, 400.9,402-404, 410-414,420-429	393-398,402-404, 410-416,420-429
3. MALIGNANT NEOPLASMS	140-165,171-205	140-162.2,162.8, 163-165,171-207	140-209	140-208
4. ALL OTHER CAUSES	remainder, 001-E999	remainder, 001-E999	remainder, 000-E999	remainder, 001-E999

SOURCES: World Health Organization, 1977. International Classification of Diseases: Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death. Geneva. Also, Statistics Canada: Data Retrieval, Vital Statistics and Disease Registries Section, 1985, Ottawa.

TABLE B-23

Number of Deaths by Frequency and Percent(1), for Ages 35+, Canada and Regions; 1951-1981

	1951		1961		1971		1981		TOTAL	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
CAUSES										
All	99,395	(100.0)	117,762	(100.0)	139,302	(100.0)	154,963	(100.0)	511,422	(100.0)
Cardiovascular	38,995	(39.2)	49,637	(42.2)	54,755	(39.4)	57,663	(37.2)	201,050	(39.3)
Malignant Neoplasms	16,830	(16.9)	22,379	(19.0)	29,755	(21.4)	38,955	(25.2)	107,919	(21.1)
All Other	43,570	(43.8)	45,746	(38.0)	54,792	(39.3)	58,345	(37.6)	202,453	(39.5)
REGION										
Atlantic	10,961	(11.0)	12,132	(10.3)	13,862	(10.0)	14,827	(9.6)	51,782	(10.1)
Quebec	25,151	(25.3)	29,505	(25.1)	35,709	(25.6)	37,834	(24.4)	128,199	(25.1)
Ontario	37,112	(37.3)	44,172	(37.5)	51,099	(36.7)	58,671	(37.9)	191,054	(37.4)
Prairies	16,301	(16.4)	19,446	(16.5)	22,799	(16.4)	25,749	(16.6)	84,295	(16.5)
British Columbia	9,870	(9.9)	12,507	(10.6)	15,833	(11.4)	17,882	(11.5)	56,092	(11.0)
GENDER										
Males	56,063	(56.4)	68,355	(58.0)	80,188	(57.6)	86,102	(55.6)	290,708	(56.8)
Females	43,332	(43.6)	49,407	(42.0)	59,114	(42.4)	68,861	(44.4)	220,714	(43.2)
MARITAL STATUS(2)										
Single	13,541	(13.6)	14,710	(12.5)	16,602	(11.9)	17,191	(11.1)	62,044	(12.1)
Married	52,314	(52.5)	62,671	(53.2)	73,519	(52.8)	80,098	(51.7)	268,602	(52.5)
Widowed	33,102	(33.3)	39,556	(33.6)	47,165	(33.9)	52,934	(34.2)	172,757	(33.8)
Divorced	438	(0.4)	825	(0.7)	2,016	(1.4)	4,740	(3.1)	8,019	(1.6)
AGE										
35-44	5,269	(5.3)	5,243	(4.5)	5,767	(4.1)	5,102	(3.3)	21,381	(4.2)
45-54	9,559	(9.6)	10,933	(9.3)	12,641	(9.1)	11,634	(7.5)	44,767	(8.8)
55-64	17,741	(17.8)	18,759	(15.9)	23,321	(16.7)	24,591	(15.9)	84,412	(16.5)
65-69	12,973	(13.1)	13,732	(11.7)	15,812	(11.4)	18,659	(12.0)	61,176	(12.0)
70+	53,853	(54.2)	69,095	(58.7)	81,761	(58.7)	94,977	(61.3)	299,686	(58.6)

(1) Due to rounding, the percentages may not equal exactly 100.0%.

(2) Due to 3,826 cases in which marital status was not listed, this caused the number of deaths analyzed in this study to drop from 515,248 to 511,422, due to their deletion.

SOURCE: Statistics Canada, Canadian Mortality Data Base for years 1951, 1961, 1971, and 1981. Categorical frequencies and percentages calculated by computer (SPSSx).

TABLE B-24

Missing Cases of Death, Deleted by Marital Status

	1951			1961			1971			1981			TOTAL 1951-1981		
	S[1]	U[2]	T[3]	S	U	T	S	U	T	S	U	T	S	U	T
GENDER															
Males	608	--	608	346	352	698	117	306	423	689	483	1,172	1,760	1,141	2,901
Females	208	--	208	121	41	162	52	51	103	270	182	452	651	274	925
AGE															
35-44	27	--	27	39	22	61	16	22	38	85	26	111	167	70	237
45-54	82	--	82	75	53	128	19	43	62	180	61	241	356	157	513
55-64	156	--	156	133	69	202	48	57	105	270	119	389	607	245	852
65-69	130	--	130	63	41	104	24	38	62	137	91	228	354	170	524
70+	421	--	421	157	208	365	62	197	259	287	368	655	927	773	1,700
REGION															
Atlantic	99	--	99	28	14	42	63	8	71	122	31	153	312	53	365
Quebec	112	--	112	153	53	206	76	41	117	778	358	1,136	1,119	452	1,571
Ontario	487	--	487	201	182	383	11	199	210	5	127	132	704	508	1,212
Prairies	49	--	49	44	69	113	10	63	73	43	78	121	146	210	356
British Columbia	69	--	69	41	75	116	9	46	55	11	71	82	130	192	322
TOTAL	816	--	816	467	393	860	169	357	526	959	665	1,624	2,411	1,415	3,826

[1] S: Separated.
[2] U: Unknown.
[3] T: Total.

SOURCE: Statistics Canada, Canadian Mortality Data Base for years 1951, 1961, 1971, and 1981. Categorical frequencies calculated by computer (SPSSx).

TABLE B-25

Frequency of All Deaths, by Canada and Region, Age and Gender, 1951-1981

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
CANADA								
35-44	5,269	(5.3)	5,243	(4.4)	5,767	(4.1)	5,102	(3.3)
Males	3,009		3,285		3,688		3,287	
Females	2,260		1,958		2,079		1,815	
45-54	9,559	(9.6)	10,933	(9.3)	12,641	(9.1)	11,634	(7.5)
Males	5,894		7,110		8,285		7,541	
Females	3,665		3,823		4,356		4,093	
55-64	17,741	(17.8)	18,759	(15.9)	23,321	(16.7)	24,591	(15.9)
Males	11,044		12,335		15,533		15,795	
Females	6,697		6,424		7,788		8,796	
65-69	12,973	(13.1)	13,732	(11.7)	15,812	(11.4)	18,659	(12.0)
Males	7,887		8,452		10,211		11,809	
Females	5,086		5,280		5,601		6,850	
70+	53,853	(54.2)	69,095	(58.7)	81,761	(58.7)	94,977	(61.3)
Males	28,229		37,173		42,471		47,670	
Females	25,624		31,922		39,290		47,307	
TOTAL	99,395	(100.0)	117,762	(100.0)	139,302	(100.0)	154,963	(100.0)
ATLANTIC								
35-44	559	(5.1)	490	(4.0)	488	(3.5)	440	(3.0)
Males	329		289		312		310	
Females	230		201		176		130	
45-54	884	(8.1)	1,014	(8.4)	1,159	(8.4)	952	(6.4)
Males	513		652		793		632	
Females	371		362		366		320	
55-64	1,637	(14.9)	1,707	(14.1)	2,238	(16.1)	2,256	(15.2)
Males	959		1,098		1,515		1,480	
Females	678		609		723		776	
65-69	1,240	(11.3)	1,387	(11.4)	1,458	(10.5)	1,832	(12.4)
Males	719		819		965		1,169	
Females	521		568		493		663	
70+	6,641	(60.5)	7,534	(62.1)	8,519	(61.5)	9,347	(63.0)
Males	3,400		3,901		4,407		4,843	
Females	3,241		3,633		4,112		4,504	

TABLE B-25
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
TOTAL	10,961	(100.0)	12,132	(100.0)	13,862	(100.0)	14,827	(100.0)
QUEBEC								
35-44	1,731	(6.9)	1,621	(5.5)	1,691	(4.7)	1,460	(3.9)
Males	924		1,021		1,054		980	
Females	807		600		637		480	
45-54	2,909	(11.6)	3,205	(10.9)	3,679	(10.3)	3,219	(8.5)
Males	1,743		2,044		2,442		2,104	
Females	1,166		1,161		1,237		1,115	
55-64	4,790	(19.0)	5,487	(18.6)	6,878	(19.3)	6,773	(17.9)
Males	2,850		3,455		4,550		4,420	
Females	1,940		2,032		2,328		2,353	
65-69	3,184	(12.7)	3,695	(12.5)	4,442	(12.4)	4,900	(12.9)
Males	1,813		2,225		2,800		3,096	
Females	1,371		1,470		1,642		1,804	
70+	12,537	(49.8)	15,497	(52.5)	19,019	(53.3)	21,482	(56.8)
Males	6,274		7,897		9,587		10,775	
Females	6,263		7,600		9,432		10,707	
TOTAL	25,151	(100.0)	29,505	(100.0)	35,709	(100.0)	37,834	(100.0)
ONTARIO								
35-44	1,725	(4.6)	1,844	(4.2)	2,057	(4.0)	1,672	(2.8)
Males	1,007		1,168		1,301		1,011	
Females	718		676		756		661	
45-54	3,441	(9.3)	4,069	(9.2)	4,609	(9.0)	4,387	(7.5)
Males	2,193		2,677		2,989		2,798	
Females	1,248		1,392		1,620		1,589	
55-64	6,679	(18.0)	7,168	(16.2)	8,567	(16.8)	9,338	(15.9)
Males	4,613		4,807		5,742		5,955	
Females	2,516		2,361		2,825		3,383	
65-69	4,757	(12.8)	5,205	(11.8)	5,992	(11.7)	6,976	(11.9)
Males	2,810		3,197		3,849		4,455	
Females	1,947		2,008		2,143		2,521	
70+	20,510	(55.3)	25,886	(58.6)	29,874	(58.5)	36,298	(61.9)
Males	10,171		13,167		14,951		17,445	
Females	10,339		12,719		14,923		18,853	

TABLE B-25
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
TOTAL	37,112	(100.0)	44,172	(100.0)	51,099	(100.0)	58,671	(100.0)
PRAIRIES								
35-44	800	(4.9)	785	(4.1)	887	(3.9)	887	(3.4)
Males	463		491		595		571	
Females	337		294		292		316	
45-54	1,460	(9.0)	1,634	(8.4)	1,810	(8.0)	1,794	(7.0)
Males	904		1,075		1,194		1,192	
Females	556		559		616		602	
55-64	2,955	(18.1)	2,745	(14.1)	3,289	(14.4)	3,626	(14.1)
Males	1,949		1,888		2,179		2,329	
Females	1,006		857		1,110		1,297	
65-69	2,291	(14.0)	2,147	(11.0)	2,335	(10.2)	2,926	(11.4)
Males	1,510		1,388		1,557		1,84[illegible]	
Females	781		759		778		1,078	
70+	8,795	(54.0)	12,135	(62.4)	14,478	(63.5)	16,516	(64.1)
Males	5,157		7,438		8,172		8,820	
Females	3,638		4,697		6,306		7,696	
TOTAL	16,301	(100.0)	19,446	(100.0)	22,799	(100.0)	25,749	(100.0)
BRITISH COLUMBIA								
35-44	454	(4.6)	503	(4.0)	644	(4.1)	643	(3.6)
Males	286		31[illegible]		426		415	
Females	168		187		218		228	
45-54	865	(8.8)	1,011	(8.1)	1,384	(8.7)	1,282	(7.2)
Males	541		662		867		815	
Females	324		349		517		467	
55-64	1,680	(17.0)	1,652	(13.2)	2,349	(14.9)	2,598	(14.5)
Males	1,123		1,087		1,547		1,611	
Females	557		565		802		987	
65-69	1,501	(15.2)	1,298	(10.4)	1,585	(10.0)	2,025	(11.3)
Males	1,035		823		1,040		1,241	
Females	466		475		545		784	
70+	5,370	(54.4)	8,043	(64.3)	9,871	(62.3)	11,334	(63.4)
Males	3,227		4,770		5,354		5,787	

TABLE B-25
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
Females	2,143		3,273		4,517		5,547	
TOTAL	9,870	(100.0)	12,507	(100.0)	15,833	(100.0)	17,882	(100.0)

SOURCE: Statistics Canada, Canadian Mortality Data Base for years 1951, 1961, 1971, 1981. Categorical frequencies calculated through SPSSx.

TABLE B-26

Frequency of Deaths due to Cardiovascular Disease, by Age and Gender, for Canada and Regions, 1951-1981

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
CANADA								
35-44	1,212	(3.1)	1,271	(2.6)	1,106	(2.0)	931	(1.6)
Males	812		1,024		903		755	
Females	400		247		203		176	
45-54	3,169	(8.1)	4,064	(8.2)	4,065	(7.4)	3,320	(5.8)
Males	2,339		3,215		3,304		2,683	
Females	830		849		761		637	
55-64	7,103	(18.2)	7,865	(15.8)	8,814	(16.1)	8,279	(14.4)
Males	4,918		5,772		6,725		6,141	
Females	2,185		2,093		2,089		2,138	
65-69	5,334	(13.7)	6,069	(12.2)	6,438	(11.8)	6,885	(11.9)
Males	3,417		3,891		4,364		4,701	
Females	1,917		2,178		2,074		2,184	
70+	22,177	(56.9)	30,368	(61.2)	34,332	(62.7)	38,248	(66.3)
Males	11,839		16,555		17,637		18,744	
Females	10,338		13,813		16,695		19,504	
TOTAL	38,995	(100.0)	49,637	(100.0)	54,755	(100.0)	57,663	(100.0)
ATLANTIC								
35-44	100	(2.6)	106	(2.2)	108	(2.0)	92	(1.6)
Males	56		79		80		77	
Females	44		27		28		15	
45-54	262	(6.8)	351	(7.2)	369	(6.6)	288	(5.0)
Males	184		277		309		228	
Females	78		74		60		60	
55-64	578	(15.1)	677	(13.9)	870	(15.6)	829	(14.3)
Males	391		509		677		622	
Females	187		168		193		207	
65-69	486	(12.7)	589	(12.1)	625	(11.2)	712	(12.3)
Males	293		368		430		484	
Females	193		221		195		228	
70+	2,402	(62.8)	3,152	(64.6)	3,597	(64.6)	3,879	(66.8)
Males	1,262		1,678		1,918		1,932	
Females	1,140		1,474		1,679		1,947	

TABLE B-26
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
TOTAL	3,828	(100.0)	4,875	(100.0)	5,569	(100.0)	5,800	(100.0)
QUEBEC								
35-44	408	(4.5)	415	(3.4)	362	(2.6)	308	(2.2)
Males	268		339		279		256	
Females	140		76		83		52	
45-54	936	(10.3)	1,207	(9.9)	1,269	(9.2)	960	(6.9)
Males	677		917		1,011		755	
Females	259		290		258		205	
55-64	1,787	(19.7)	2,325	(19.2)	2,637	(19.1)	2,328	(16.8)
Males	1,199		1,646		1,946		1,671	
Females	588		679		691		657	
65-69	1,185	(13.1)	1,568	(12.9)	1,795	(13.0)	1,850	(13.4)
Males	723		972		1,177		1,209	
Females	462		596		618		641	
70+	4,741	(52.4)	6,633	(54.6)	7,763	(56.1)	8,415	(60.7)
Males	2,379		3,378		3,884		4,121	
Females	2,362		3,255		3,879		4,294	
TOTAL	9,057	(100.0)	12,148	(100.0)	13,826	(100.0)	13,861	(100.0)
ONTARIO								
35-44	438	(2.8)	482	(2.5)	399	(1.9)	312	(1.4)
Males	309		400		339		249	
Females	129		82		60		63	
45-54	1,271	(8.1)	1,606	(8.2)	1,523	(7.2)	1,276	(5.7)
Males	960		1,294		1,250		1,034	
Females	311		312		273		242	
55-64	2,895	(18.4)	3,144	(16.1)	3,385	(16.0)	3,136	(14.1)
Males	1,992		2,325		2,607		2,352	
Females	903		819		778		784	
65-69	2,084	(13.2)	2,445	(12.4)	2,540	(12.0)	2,598	(11.7)
Males	1,285		1,567		1,717		1,803	
Females	799		878		823		795	
70+	9.044	(57.5)	11,897	(60.8)	13,330	(62.9)	14,899	(67.1)
Males	4,570		6,183		6,476		6,920	
Females	4,474		5,714		6,854		7,979	

TABLE B-26
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
TOTAL	15,732	(100.0)	19,574	(100.0)	21,177	(100.0)	22,221	(100.0)
PRAIRIES								
35-44	170	(2.7)	159	(2.1)	141	(1.7)	133	(1.4)
Males	113		123		122		110	
Females	57		36		19		23	
45-54	439	(7.0)	547	(7.2)	540	(6.5)	481	(5.1)
Males	330		442		438		407	
Females	109		105		102		74	
55-64	1,169	(18.6)	1,035	(13.6)	1,120	(13.4)	1,176	(12.5)
Males	868		797		871		892	
Females	301		238		249		284	
65-69	947	(15.0)	889	(11.7)	891	(10.6)	1,040	(11.1)
Males	662		600		616		729	
Females	285		289		275		311	
70+	3,570	(56.7)	4,980	(65.4)	5,670	(67.8)	6,547	(69.9)
Males	2,170		3,138		3,231		3,513	
Females	1,400		1,841		2,439		3,034	
TOTAL	6,295	(100.0)	7,610	(100.0)	8,362	(100.0)	9,377	(100.0)
BRITISH COLUMBIA								
35-44	96	(2.3)	109	(2.0)	96	(1.7)	86	(1.3)
Males	66		83		83		63	
Females	30		26		13		23	
45-54	261	(6.4)	353	(6.5)	364	(6.2)	315	(4.9)
Males	188		285		296		259	
Females	73		68		68		56	
55-64	674	(16.5)	684	(12.6)	802	(13.8)	810	(12.7)
Males	468		495		624		604	
Females	206		189		178		206	
65-69	632	(15.5)	578	(10.7)	587	(10.1)	685	(10.7)
Males	454		384		424		476	
Females	178		194		163		209	
70+	2,420	(59.3)	3,706	(68.2)	3,972	(68.2)	4,508	(70.4)
Males	1,458		2,178		2,128		2,258	

TABLE B-26
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
Females	962		1,528		1,844		2,250	
TOTAL	4,083	(100.0)	5,430	(100.0)	5,821	(100.0)	6,404	(100.0)

SOURCE: Statistics Canada, Canadian Mortality Data Base for years 1951, 1961, 1971, 1981. Categorical frequencies calculated through SPSSx.

TABLE B-27

Frequency of Deaths due to Malignant Neoplasms, by Age and Gender, for Canada and Regions, 1951-1981

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
CANADA								
35-44	1,027	(6.1)	1,232	(5.5)	1,336	(4.5)	1,295	(3.3)
Males	342		473		589		582	
Females	685		759		747		713	
45-54	2,267	(13.5)	2,876	(12.9)	3,608	(12.1)	3,922	(10.1)
Males	981		1,310		1,738		1,971	
Females	1,286		1,566		1,870		1,951	
55-64	4,005	(23.8)	4,819	(21.5)	6,894	(23.2)	8,907	(22.9)
Males	2,114		2,731		3,930		4,988	
Females	1,891		2,088		2,964		3,919	
65-69	2,632	(15.6)	3,129	(14.0)	4,276	(14.4)	5,964	(15.3)
Males	1,525		1,879		2,651		3,492	
Females	1,107		1,250		1,625		2,472	
70+	6,899	(41.0)	10,323	(46.1)	13,641	(45.8)	18,867	(48.4)
Males	3,813		6,074		7,783		10,597	
Females	3,086		4,249		5,858		8,270	
TOTAL	16,830	(100.0)	22,379	(100.0)	29,755	(100.0)	37,955	(100.0)
ATLANTIC								
35-44	91	(5.1)	122	(5.5)	119	(4.3)	125	(3.5)
Males	41		45		50		62	
Females	50		77		69		63	
45-54	211	(11.8)	276	(12.5)	342	(12.2)	331	(9.4)
Males	99		119		177		178	
Females	112		157		165		153	
55-64	394	(22.0)	468	(21.1)	647	(23.2)	771	(21.9)
Males	200		256		360		449	
Females	194		212		287		322	
65-69	269	(15.0)	311	(14.1)	387	(13.8)	563	(16.0)
Males	155		175		251		342	
Females	114		136		136		221	
70+	824	(46.1)	1,036	(46.8)	1,301	(46.5)	1,737	(49.2)
Males	415		598		723		1,016	
Females	409		438		578		721	

TABLE B-27
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
TOTAL	1,789	(100.0)	2,213	(100.0)	2,796	(100.0)	3,527	(100.0)
QUEBEC								
35-44	342	(7.7)	360	(5.9)	433	(5.1)	367	(3.6)
Males	95		137		187		184	
Females	247		223		246		183	
45-54	671	(15.1)	858	(14.0)	1,116	(13.2)	1,108	(10.8)
Males	286		391		564		581	
Females	385		467		552		527	
55-64	1,042	(23.4)	1,379	(22.6)	2,076	(24.5)	2,483	(24.2)
Males	530		752		1,188		1,477	
Females	512		627		888		1,006	
65-69	683	(15.4)	894	(14.6)	1,232	(14.6)	1,620	(15.8)
Males	379		547		765		984	
Females	304		347		467		636	
70+	1,710	(38.4)	2,622	(42.9)	3,612	(42.6)	4,672	(45.6)
Males	911		1,473		1,969		2,619	
Females	799		1,149		1,643		2,053	
TOTAL	4,448	(100.0)	6,113	(100.0)	8,469	(100.0)	10,250	(100.0)
ONTARIO								
35-44	351	(5.8)	444	(5.5)	500	(4.7)	463	(3.2)
Males	113		173		207		191	
Females	238		271		293		272	
45-54	811	(13.3)	1,036	(12.9)	1,272	(12.1)	1,565	(10.7)
Males	353		473		590		772	
Females	458		563		682		793	
55-64	1,505	(24.7)	1,809	(22.5)	2,454	(23.3)	3,439	(23.6)
Males	789		1,049		1,397		1,891	
Females	716		760		1,057		1,548	
65-69	938	(15.3)	1,120	(14.0)	1,563	(14.8)	2,179	(15.0)
Males	528		660		950		1,298	
Females	410		460		613		881	
70+	2,493	(40.9)	3,615	(45.1)	4,754	(45.1)	6,922	(47.5)
Males	1,315		2,017		2,686		3,741	
Females	1,178		1,598		2,068		3,181	

TABLE B-27
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
TOTAL	6,098	(100.0)	8,024	(100.0)	10,543	(100.0)	14,568	(100.0)
PRAIRIES								
35-44	178	(6.3)	178	(4.8)	168	(3.6)	186	(3.0)
Males	64		70		92		77	
Females	114		108		76		109	
45-54	378	(13.3)	448	(12.1)	532	(11.3)	507	(8.3)
Males	172		217		266		246	
Females	206		231		266		261	
55-64	688	(24.2)	748	(20.3)	1,021	(21.7)	1,283	(21.0)
Males	390		443		591		685	
Females	298		305		430		598	
65-69	449	(15.8)	513	(13.9)	666	(14.1)	918	(15.0))
Males	280		316		427		502	
Females	169		197		239		416	
70+	1,152	(40.4)	1,802	(48.9)	2,326	(49.3)	3,216	(52.7)
Males	720		1,186		1,450		1,896	
Females	432		616		876		1,320	
TOTAL	2,845	(100.0)	3,689	(100.0)	4,713	(100.0)	6,110	(100.0)
BRITISH COLUMBIA								
35-44	65	(3.9)	128	(5.5)	116	(3.6)	154	(3.4)
Males	29		48		53		68	
Females	36		80		63		86	
45-54	196	(11.9)	258	(11.0)	346	(10.7)	411	(9.1)
Males	71		110		141		194	
Females	125		148		205		217	
55-64	376	(22.8)	415	(17.7)	696	(21.5)	931	(20.7)
Males	205		231		394		486	
Females	171		184		302		445	
65-69	293	(17.8)	291	(12.5)	428	(13.2)	684	(15.2)
Males	183		181		258		366	
Females	110		110		170		318	
70+	720	(43.6)	1,248	(53.3)	1,648	(51.0)	2,320	(51.6)
Males	452		800		955		1,325	

TABLE B-27
(continued)

	1951		1961		1971		1981	
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)
Females	268		448		693		995	
TOTAL	1,650	(100.0)	2,340	(100.0)	3,234	(100.0)	4,500	(100.0)

SOURCE: Statistics Canada, Canadian Mortality Data Base for years 1951, 1961, 1971, 1981. Categorical frequencies calculated through SPSSx.

TABLE B-28

Population by Region, Sex and Year

	1951	1961	1971	1981
CANADA	5,430,833	6,938,672	8,280,900	9,969,050
35-44	1,864,475	2,385,138	2,520,630	2,960,105
Males	947,408	1,188,277	1,282,560	1,492,590
Females	917,067	1,196,861	1,238,070	1,467,515
45-54	1,405,314	1,875,579	2,287,695	2,493,690
Males	726,839	956,643	1,130,145	1,253,440
Females	678,475	918,936	1,157,550	1,240,250
55-64	1,075,668	1,287,870	1,729,495	2,156,240
Males	556,129	653,708	852,785	1,029,025
Females	519,539	634,162	876,710	1,127,215
65-69	433,139	486,662	619,385	843,520
Males	227,845	239,433	295,720	390,125
Females	205,294	247,229	323,665	453,395
70+	652,237	903,423	1,123,695	1,515,495
Males	322,864	434,037	485,400	619,640
Females	329,373	469,386	638,295	895,855
ATLANTIC	574,226	672,745	739,435	856,520
35-44	197,546	219,798	204,305	248,595
Males	102,818	110,835	103,490	126,010
Females	94,728	108,963	100,815	122,585
45-54	138,837	182,401	199,835	199,385
Males	71,167	95,422	100,215	99,715
Females	67,670	86,979	99,620	99,670
55-64	110,688	122,387	163,740	186,730
Males	56,518	62,278	83,585	90,615
Females	54,170	60,109	80,155	96,115
65-69	46,065	50,823	57,425	79,310
Males	23,688	25,179	28,015	37,785
Females	22,377	25,644	29,410	41,525
70+	81,090	97,336	114,130	142,500
Males	39,957	46,853	50,615	60,635
Females	41,133	50,483	63,515	81,865
QUEBEC	1,381,860	1,822,932	2,214,245	2,641,770
35-44	518,290	665,734	719,575	827,945
Males	257,826	329,279	358,755	413,590
Females	260,464	336,455	360,820	414,355
45-54	375,657	511,334	621,710	682,095
Males	188,952	256,145	303,990	335,395
Females	186,705	255,189	317,720	346,700
55-64	255,816	339,563	459,935	562,350
Males	128,944	167,581	221,520	264,935
Females	126,872	171,982	238,415	297,415
65-69	93,161	116,923	160,525	211,645

TABLE B-28
(continued)

	1951	1961	1971	1981
Males	46,774	56,708	73,635	95,055
Females	46,387	60,215	86,890	116,590
70+	138,936	189,378	252,500	357,735
Males	66,693	87,992	106,935	140,835
Females	72,243	101,386	145,565	216,900
ONTARIO	1,951,901	2,522,018	3,061,650	3,683,630
35-44	643,139	866,563	942,670	1,073,165
Males	327,548	432,818	481,250	538,705
Females	315,591	433,745	461,420	534,460
45-54	515,607	670,544	850,945	936,920
Males	264,717	341,756	421,325	472,035
Females	250,890	328,788	429,620	464,885
55-64	392,792	476,838	623,600	805,335
Males	196,789	238,856	306,555	384,535
Females	196,003	237,982	317,045	420,800
65-69	155,097	180,063	227,765	305,505
Males	77,350	85,855	106,070	141,145
Females	77,747	94,208	121,695	164,360
70+	245,266	328,010	416,670	562,705
Males	112,860	145,910	168,870	220,745
Females	132,406	182,100	247,800	341,960
PRAIRIES	994,447	1,223,190	1,370,260	1,611,445
35-44	336,681	409,230	398,295	469,190
Males	173,612	205,925	205,125	239,945
Females	163,069	203,305	193,170	229,245
45-54	250,520	326,477	371,905	395,840
Males	135,124	169,111	185,380	202,275
Females	115,396	157,366	186,525	193,565
55-64	207,622	225,547	291,000	344,975
Males	116,112	120,510	146,705	167,800
Females	91,510	105,037	144,295	177,175
65-69	85,889	88,101	105,440	139,035
Males	50,088	46,623	53,805	65,780
Females	35,801	41,478	51,635	73,255
70+	113,735	173,835	203,620	262,405
Males	63,340	93,962	97,620	115,940
Females	50,395	79,873	106,000	146,465
BRITISH COLUMBIA	528,399	697,787	895,310	1,175,685
35-44	168,819	223,813	255,785	341,210
Males	85,604	109,420	133,940	174,340
Females	83,215	114,393	121,845	166,870
45-54	124,693	184,823	243,300	279,450
Males	66,879	94,209	119,235	144,020

TABLE B-28
(continued)

	1951	1961	1971	1981
Females	57,814	90,614	124,065	135,430
55-64	108,750	123,535	191,220	256,850
Males	57,766	64,483	94,420	121,140
Females	50,984	59,052	96,800	135,710
65-69	52,927	50,752	68,230	108,025
Males	29,945	25,068	34,195	50,360
Females	22,982	25,684	34,035	57,665
70+	73,210	114,864	136,775	190,150
Males	40,014	59,320	61,360	81,485
Females	33,196	55,544	75,415	108,665

SOURCE: Statistics Canada, Canadian Mortality Data Base for years 1951, 1961, 1971, 1981. Categorical frequencies calculated through SPSSx.

TABLE B-29

Unstandardized Death Rates(1) for Cardiovascular Disease (Per 1,000 Pop) for Ages 35+, by Year, Gender, Marital Status and Region

	1951	1961	1971	1981
GENDER				
Males	8.4	8.8	8.1	6.9
Females	5.9	5.5	5.2	4.8
MARITAL STATUS				
Single	1.9	2.0	2.0	2.1
Married	1.2	1.2	1.1	1.0
Widowed	5.3	5.6	5.3	4.6
Divorced	2.4	2.1	1.6	1.2
REGION				
Atlantic	6.7	7.3	7.5	6.8
Quebec	6.6	6.7	6.2	5.3
Ontario	8.1	7.8	6.9	6.0
Prairies	6.3	6.2	6.1	5.8
British Columbia	7.7	7.8	6.5	5.4
CANADA	7.2	7.2	6.6	5.8

(1) Rates obtained by taking the sum of the frequency of deaths by cardiovascular disease and gender, marital status or region (35+), divided by the sum of the frequency of the population alive, by gender, marital status or region (35+), X 1,000.

TABLE B-30

Unstandardized Death Rate⁽¹⁾ for Malignant Neop~~l~~asm (Per 1,000 Pop) for Ages 35+, by Year, Gender, Marital Status and Region

	1951	1961	1971	1981
GENDER				
Males	3.2	3.6	4.1	4.5
Females	3.0	2.9	3.1	3.3
MARITAL STATUS				
Single	.9	1.0	1.1	1.3
Married	.6	.7	.7	.8
Widowed	1.9	2.1	2.1	2.2
Divorced	1.5	1.2	1.1	1.0
REGION				
Atlantic	3.1	3.3	3.8	4.1
Quebec	3.2	3.4	3.8	3.9
Ontario	3.1	3.2	3.4	4.0
Prairies	2.9	3.0	3.4	3.8
British Columbia	3.1	3.4	3.6	3.8
CANADA	3.1	3.2	3.6	3.9

(1) Rates obtained by taking the sum of the frequency of deaths by malignant neoplasms and gender, marital status or region (35+), divided by the sum of the frequency of the population alive by gender, marital status or region (35+), X 1,000.

TABLE B-31

Age-Specific and Standardized General Death Rates (Per 1,000 Pop) for Canada, by Year, Marital Status and Sex, for Ages 35+

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1951						
Single	4.7	9.8	20.9	35.7	90.2	22.0
Males	5.8	12.6	25.8	42.7	97.3	25.5
Females	3.5	6.3	14.7	25.8	82.9	17.8
Married	2.5	6.3	15.6	28.5	68.0	16.0
Males	2.7	7.3	18.3	31.6	72.7	17.7
Females	2.3	5.2	12.1	24.0	59.6	13.6
Widowed	4.2	7.1	17.8	31.0	96.0	20.8
Males	7.1	11.5	27.3	43.2	113.6	27.9
Females	3.3	5.8	14.6	25.8	87.2	18.1
Divorced	4.9	11.0	32.5	63.2	120.4	30.4
Males	7.1	16.2	42.1	82.0	139.4	38.3
Females	3.6	6.5	20.4	26.0	76.4	18.2
1961						
Single	3.8	8.5	18.5	32.6	83.7	19.8
Males	4.8	11.3	25.0	42.7	96.8	24.6
Females	2.6	5.4	11.1	22.0	71.1	14.8
Married	2.0	5.4	13.9	27.7	63.1	14.6
Males	2.4	6.8	17.6	33.3	71.6	17.3
Females	1.5	3.8	9.4	20.2	48.5	10.8
Widowed	3.1	6.6	14.5	27.2	89.9	18.6
Males	5.5	10.3	23.6	40.8	115.4	26.3
Females	2.4	5.7	11.9	23.0	79.2	16.0
Divorced	5.6	12.0	24.6	52.0	128.3	29.4
Males	9.0	19.4	35.6	70.8	142.1	37.9
Females	3.5	6.7	13.7	27.1	102.5	20.1
1971						
Single	5.0	9.7	17.7	29.6	74.4	19.0
Males	6.4	13.4	25.3	42.4	94.8	25.4
Females	3.1	5.4	10.4	17.9	59.2	13.0
Married	2.0	5.0	12.7	25.2	60.9	13.8
Males	2.4	6.5	16.7	32.0	72.6	17.1
Females	1.5	3.5	7.9	16.3	41.8	9.3
Widowed	3.3	6.7	14.2	23.8	85.4	17.8
Males	4.4	13.9	28.1	47.9	128.6	29.9
Females	3.0	5.2	11.5	18.6	72.8	14.9
Divorced	5.0	10.0	22.7	36.7	73.4	20.5
Males	7.1	15.2	34.0	51.7	100.4	29.3
Females	3.5	5.9	13.0	22.5	44.7	12.4

TABLE B-31
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1981						
Single	4.4	9.2	17.7	28.3	68.8	17.9
Males	5.8	12.6	25.0	43.6	92.0	24.7
Females	2.5	4.7	10.0	16.0	54.8	11.9
Married	1.3	4.0	10.4	21.4	53.0	11.6
Males	1.7	5.0	13.6	27.5	64.8	14.5
Females	1.0	3.0	6.9	13.8	34.3	7.7
Widowed	3.8	6.7	13.1	21.1	72.0	16.0
Males	7.7	13.9	27.6	43.4	114.4	28.9
Females	3.1	5.3	10.5	17.0	62.5	13.4
Divorced	4.1	9.1	17.5	31.8	66.8	17.8
Males	6.5	14.2	27.1	47.3	91.3	26.0
Females	2.6	5.2	10.0	18.7	44.7	11.1

Rates calculated by: ma = da/pa X 1,000 (where ma = rates, da = the sum of the frequency of deaths for age group a, and pa = the sum of the population for age group a). Generated through SPSSx.

Standardized rates: The rates in each age group are multiplied by the standard population (i.e., the population alive in Canada in 1951, by age group), and then divided by the total standard population.

TABLE B-32

Age-Specific and Standardized Cardiovascular Disease Death Rates (Per 1,000 Pop) for Canada, by Year, Marital Status and Sex, for Ages 35+

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1951						
Single	1.0	2.9	7.7	13.5	36.4	8.1
Males	1.3	4.2	10.3	16.9	40.4	9.8
Females	.7	1.3	4.4	8.8	32.3	6.0
Married	.6	2.2	6.4	11.9	28.2	6.4
Males	.8	3.0	8.4	14.0	30.6	7.5
Females	.4	1.2	3.9	8.8	23.8	4.8
Widowed	1.0	1.9	6.6	12.7	39.5	7.9
Males	1.9	3.9	11.1	18.3	47.5	11.0
Females	.8	1.3	5.0	10.3	35.5	6.7
Divorced	1.1	4.2	16.1	32.3	55.8	13.9
Males	2.1	6.3	20.9	38.2	66.7	17.6
Females	.5	2.2	9.4	19.4	27.6	7.4
1961						
Single	.9	2.8	7.3	13.5	35.9	7.9
Males	1.2	4.5	10.7	18.2	42.3	10.2
Females	.4	1.0	3.4	8.5	29.7	5.3
Married	.5	2.1	6.1	12.5	28.1	6.3
Males	.8	3.2	8.5	15.6	32.4	7.9
Females	.2	.9	3.1	8.1	20.6	4.0
Widowed	.4	1.8	5.3	11.9	39.4	7.3
Males	1.5	3.6	10.0	17.9	50.4	10.9
Females	.1	1.3	3.9	10.0	34.7	6.1
Divorced	1.7	3.0	10.2	21.8	54.2	11.6
Males	3.0	5.2	15.3	31.7	62.6	15.4
Females	.9	1.3	5.1	8.2	38.0	6.9
1971						
Single	.8	2.8	6.1	11.6	30.4	6.8
Males	1.1	4.4	9.8	17.9	39.2	9.6
Females	.3	.8	2.5	5.7	23.8	4.1
Married	.4	1.7	5.0	10.6	25.2	5.4
Males	.6	2.7	7.4	13.7	30.0	7.1
Females	.2	.6	2.1	6.4	17.2	3.2
Widowed	.3	1.7	4.7	9.0	36.5	6.6
Males	.7	5.6	11.8	19.9	53.8	12.1
Females	.2	.8	3.2	6.8	31.5	5.2
Divorced	.8	2.7	8.0	14.2	29.9	7.3
Males	1.6	4.7	14.1	22.8	39.8	11.2
Females	.2	1.1	2.9	6.0	19.4	3.7

TABLE B-32
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1981						
Single	.8	2.4	5.4	10.5	27.3	6.1
Males	1.2	3.7	8.6	17.2	35.7	8.8
Females	.2	.7	2.1	5.1	22.2	3.7
Married	.3	1.2	3.7	8.0	21.0	4.3
Males	.4	1.9	5.5	11.0	25.7	5.7
Females	.1	.4	1.7	4.3	13.6	2.5
Widowed	.5	1.6	3.7	7.4	29.6	5.4
Males	1.1	4.2	9.0	16.9	45.1	10.0
Females	.3	1.1	2.7	5.6	26.2	4.5
Divorced	.5	2.7	5.3	11.0	24.0	5.7
Males	1.1	5.0	9.3	17.7	29.7	8.5
Females	.1	.9	2.1	5.3	17.5	3.2

Rates calculated by: ma = da/pa X 1,000 (where ma = rates, da = the sum of the frequency of deaths for age group a, and pa = the sum of the population for age group a). Generated through SPSSx.

Standardized rates: the rates in each group are multiplied by the standard population (i.e., the population alive in Canada in 1951, by age group), and then divided by the total standard population.

TABLE B-33

Age-Specific and Standardized Malignant Neoplasm Death Rates (Per 1,000 Pop) for Canada, by Year, Marital Status and Sex, for Ages 35+

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1951						
Single	.6	1.9	4.7	6.5	10.5	3.4
Males	.5	1.7	4.4	6.7	11.0	3.3
Females	.8	2.2	5.1	6.3	10.1	3.6
Married	.5	1.5	3.5	5.8	10.2	3.0
Males	.3	1.3	3.6	6.4	11.0	3.0
Females	.7	1.8	3.4	5.0	8.8	2.9
Widowed	.8	2.1	4.1	6.5	11.0	3.5
Males	.8	2.3	4.9	8.4	13.9	4.2
Females	.9	2.1	3.9	5.7	9.6	2.4
Divorced	1.1	1.8	6.5	14.4	14.5	5.0
Males	.6	2.4	8.8	18.2	17.5	6.1
Females	1.5	1.4	3.3	6.4	7.6	2.9
1961						
Single	.6	1.9	4.2	7.3	12.1	3.6
Males	.6	1.6	4.6	9.1	13.9	3.9
Females	.8	2.3	3.7	5.3	10.3	3.2
Married	.5	1.5	3.6	6.4	11.0	3.1
Males	.4	1.3	4.1	7.6	12.8	3.4
Females	.6	1.6	3.1	4.8	7.7	2.5
Widowed	.7	1.9	4.1	6.1	11.8	3.5
Males	.3	2.1	5.0	8.3	16.9	4.3
Females	.9	1.9	3.9	5.4	9.6	3.1
Divorced	.8	2.9	5.2	11.2	22.1	5.6
Males	1.1	3.8	6.3	15.4	24.2	6.7
Females	.7	2.2	4.2	5.7	18.3	4.3
1971						
Single	.7	2.1	4.7	7.3	11.9	3.7
Males	.7	2.1	5.2	8.6	15.3	4.3
Females	.8	2.2	4.2	6.1	9.4	3.3
Married	.5	1.5	3.8	7.0	12.1	3.3
Males	.4	1.5	4.5	8.7	14.8	3.9
Females	.6	1.5	3.1	4.6	7.7	2.5
Widowed	.8	2.0	4.3	6.3	12.3	3.6
Males	.7	1.7	5.8	11.3	20.2	5.2
Females	.8	2.1	4.0	5.3	10.0	3.2
Divorced	.8	2.1	5.3	10.8	13.7	4.4
Males	.8	2.1	5.8	13.5	17.3	5.1
Females	.8	2.1	4.8	8.1	9.8	3.6

TABLE B-33
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1981						
Single	.6	2.4	5.4	7.3	12.8	4.0
Males	.6	2.6	6.5	9.5	17.6	5.0
Females	.6	2.2	4.2	5.4	9.8	3.2
Married	.4	1.5	3.9	7.2	12.7	3.4
Males	.4	1.4	4.5	8.7	15.7	4.0
Females	.5	1.5	3.2	5.3	7.8	2.5
Widowed	1.1	2.2	4.9	6.5	12.0	3.9
Males	1.3	2.9	7.8	10.8	21.5	6.2
Females	1.1	2.1	4.4	5.7	9.9	3.4
Divorced	.8	2.2	5.3	8.6	18.0	4.7
Males	.9	2.6	6.8	11.5	24.2	6.1
Females	.7	1.9	4.1	6.1	10.7	3.3

Rates calculated by: ma = da/pa X 1,000 (where ma = rates, da = the sum of the frequency of deaths for age group a, and pa = the sum of the population for age group a). Generated through SPSSx.

Standardized rates: the rates in each group are multiplied by the standard population (i.e., the population alive in Canada in 1951, by age group), and then divided by the total standard population.

TABLE B-34

Age-Specific and Standardized General Death Rates (Per 1,000 Pop) for Canadian Regions, by Year, Marital Status and Sex, for Ages 35+

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1951						
Atlantic	2.8	6.4	14.8	26.9	81.9	17.5
MALES	3.2	7.2	17.0	30.4	85.1	19.0
FEMALES	2.4	5.5	12.5	23.3	78.8	16.1
Single	5.6	10.6	19.6	35.4	87.0	21.8
Males	6.2	13.4	21.9	38.8	93.0	24.2
Females	4.6	6.9	16.6	30.9	80.9	18.8
Married	2.4	5.6	13.8	24.7	66.5	14.9
Males	2.6	5.9	15.6	27.2	70.0	16.1
Females	2.1	5.3	11.7	21.0	59.7	13.2
Widowed	3.4	7.8	16.1	29.1	96.0	20.2
Males	3.5	14.0	23.6	40.1	112.6	26.2
Females	3.3	5.6	13.4	24.6	88.1	17.8
Divorced	2.9	12.1	38.1	31.8	75.3	23.2
Males	3.7	16.7	47.0	23.3	80.7	26.4
Females	2.4	7.8	26.3	50.0	64.5	19.8
Quebec	3.3	7.7	18.7	34.2	90.2	20.4
MALES	3.6	9.2	22.1	38.8	94.1	22.4
FEMALES	3.1	6.3	15.3	29.6	86.7	18.5
Single	5.3	9.9	22.5	38.2	98.4	23.7
Males	7.1	14.4	31.8	50.8	105.9	29.2
Females	3.9	6.4	15.5	27.9	94.0	19.6
Married	2.9	7.5	18.0	33.8	78.8	18.7
Males	3.0	8.5	20.3	36.3	80.5	19.8
Females	2.9	6.3	15.1	30.2	75.8	17.1
Widowed	4.4	6.4	19.1	33.5	99.3	21.5
Males	6.8	8.2	27.2	42.4	114.0	26.9
Females	3.6	5.8	15.9	29.3	91.0	19.1
Divorced	2.3	7.0	23.1	23.5	110.0	22.3
Males	3.6	13.9	44.7	40.0	117.7	31.0
Females	1.7	2.4	--	--	93.8	12.5
Ontario	2.7	6.7	17.0	30.7	83.6	18.5
MALES	3.1	8.3	21.2	36.3	90.1	21.1
FEMALES	2.3	5.0	12.8	25.0	78.1	16.0
Single	4.3	9.6	20.6	33.1	90.1	21.5
Males	5.4	12.8	27.4	42.4	103.4	26.4
Females	2.9	5.9	13.9	24.3	80.8	16.9
Married	2.4	6.2	16.1	29.9	68.0	16.2
Males	2.7	7.5	19.5	33.5	74.3	18.3

TABLE B-34
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Females	2.1	4.8	12.0	24.8	57.4	13.2
Widowed	4.3	7.0	18.6	31.5	97.3	21.1
Males	7.1	12.5	30.7	46.7	117.5	29.6
Females	3.6	5.5	14.9	25.7	88.4	18.3
Divorced	5.8	12.7	36.9	60.0	121.2	32.0
Males	8.6	19.4	44.6	77.4	145.6	40.5
Females	4.3	7.9	28.3	33.6	84.9	22.0
Prairies	2.4	5.8	14.2	26.7	77.3	16.6
MALES	2.7	6.7	16.8	30.2	81.4	18.2
FEMALES	2.1	4.8	11.0	21.8	72.2	14.5
Single	3.6	8.4	18.9	35.4	83.7	20.0
Males	4.0	9.1	20.3	37.7	87.4	21.2
Females	2.8	6.9	14.5	25.1	71.1	16.1
Married	2.2	5.4	13.3	24.5	62.6	14.3
Males	2.4	6.1	15.7	27.0	67.2	15.7
Females	2.0	4.6	10.1	20.4	53.5	11.9
Widowed	3.3	6.6	16.2	29.2	94.2	19.7
Males	8.6	11.1	23.5	39.7	110.4	26.9
Females	2.1	5.3	13.5	24.1	84.9	16.9
Divorced	4.1	8.8	23.5	63.2	147.3	31.1
Males	4.8	13.7	32.8	78.8	160.2	37.2
Females	3.6	3.9	8.7	15.2	93.0	16.4
British Columbia	2.7	6.9	15.5	28.4	73.4	16.8
MALES	3.3	8.1	19.4	34.6	80.7	19.5
FEMALES	2.0	5.6	10.9	20.3	64.6	13.0
Single	5.3	11.3	22.4	39.4	87.8	22.9
Males	6.8	13.9	25.9	45.2	94.5	26.0
Females	3.0	5.8	13.3	19.5	70.6	15.2
Married	2.3	6.1	14.2	25.9	60.2	14.5
Males	2.7	6.8	17.5	30.5	66.9	16.6
Females	1.8	5.2	10.0	18.8	47.7	11.2
Widowed	5.6	10.3	15.9	28.8	86.2	20.4
Males	12.7	17.7	26.0	43.1	105.6	30.2
Females	3.9	8.5	13.0	23.1	76.0	17.1
Divorced	5.2	11.2	36.9	83.3	116.8	32.6
Males	8.9	14.5	46.0	111.7	141.4	41.8
Females	3.1	7.8	25.1	28.3	52.6	16.6
1961						
Atlantic	2.2	5.6	14.0	27.3	77.4	16.4
MALES	2.6	6.8	17.6	32.5	83.3	18.7
FEMALES	1.8	4.2	10.1	22.2	72.0	14.1

TABLE B-34
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Single	4.1	8.9	17.7	32.1	85.8	20.1
Males	5.2	10.6	22.4	39.4	96.5	23.7
Females	2.4	6.5	11.7	24.2	75.9	15.9
Married	1.9	5.0	13.3	25.2	60.6	13.9
Males	2.1	6.1	16.4	29.3	68.1	16.1
Females	1.8	3.7	9.5	19.7	47.1	10.7
Widowed	3.7	6.9	14.5	30.8	94.4	19.7
Males	6.8	10.5	23.4	46.8	115.2	27.2
Females	2.8	5.9	11.7	25.5	85.6	17.1
Divorced	7.0	16.2	16.7	70.9	106.4	28.3
Males	14.7	22.7	20.5	86.4	89.1	32.6
Females	1.9	10.6	12.7	43.5	150.0	27.4
Quebec	2.4	6.3	16.2	31.6	81.8	18.0
MALES	3.1	8.0	20.6	39.2	89.8	21.1
FEMALES	1.8	4.6	11.8	24.4	75.0	15.1
Single	3.8	8.1	18.5	35.5	85.8	20.2
Males	5.1	11.6	28.2	53.3	110.8	27.9
Females	2.6	5.5	11.9	24.1	71.8	15.2
Married	2.2	6.0	15.8	31.8	71.4	16.5
Males	2.8	7.5	19.4	37.4	76.7	18.9
Females	1.6	4.3	11.3	24.0	62.6	13.3
Widowed	2.6	6.9	16.2	29.0	91.9	19.2
Males	3.6	10.4	23.8	38.9	110.4	25.0
Females	2.3	5.8	13.7	25.2	83.1	17.0
Divorced	4.5	4.8	13.1	41.3	103.5	21.1
Males	7.1	6.8	19.7	48.4	154.6	30.5
Females	3.0	3.4	8.2	31.9	39.0	10.8
Ontario	2.1	6.1	15.0	28.9	78.9	17.1
MALES	2.7	7.8	20.1	37.2	90.2	20.7
FEMALES	1.6	4.2	9.9	21.3	69.9	13.7
Single	3.8	8.9	19.0	31.3	82.7	19.8
Males	4.8	12.1	27.2	44.0	96.0	25.2
Females	2.5	5.4	10.2	20.0	74.0	14.7
Married	1.9	5.7	14.4	28.7	64.8	15.0
Males	2.4	7.2	18.7	35.0	75.4	18.2
Females	1.4	3.9	9.2	20.5	47.7	10.7
Widowed	3.4	6.8	14.8	27.8	92.7	19.2
Males	9.2	10.2	25.9	44.9	123.3	29.3
Females	2.0	6.1	12.1	22.9	81.3	16.2
Divorced	6.8	13.4	31.5	65.7	139.5	34.0
Males	9.7	23.4	48.0	95.2	165.6	46.4
Females	5.0	7.0	18.1	35.3	106.9	22.8

TABLE B-34
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Prairies	1.9	5.0	12.2	24.4	69.8	14.7
MALES	2.4	6.4	15.7	29.8	79.2	17.4
FEMALES	1.5	3.6	8.2	18.3	58.8	11.6
Single	3.4	7.6	18.4	32.5	85.6	19.7
Males	3.8	9.3	21.2	36.5	94.3	22.1
Females	2.7	4.5	11.9	22.2	57.9	13.2
Married	1.7	4.6	11.4	23.5	57.1	12.8
Males	2.1	5.8	14.6	28.2	65.3	15.2
Females	1.3	3.3	7.4	16.6	41.1	9.0
Widowed	2.6	5.7	11.4	23.5	83.1	16.5
Males	1.7	8.9	17.8	32.8	109.1	22.1
Females	2.8	4.9	9.7	20.7	70.9	14.3
Divorced	2.7	10.8	21.1	35.2	143.7	28.0
Males	5.6	16.0	28.2	41.5	142.9	32.1
Females	.6	6.6	11.6	21.1	146.3	23.4
British Columbia	2.3	5.5	13.4	25.6	70.0	15.3
MALES	2.9	7.0	16.9	32.8	80.4	18.4
FEMALES	1.6	3.9	9.6	18.5	58.9	12.0
Single	4.6	9.8	17.7	29.7	78.3	19.4
Males	5.7	13.3	21.8	34.9	88.0	23.1
Females	2.7	5.0	9.3	19.7	57.1	12.5
Married	1.9	4.9	12.7	25.5	58.1	13.4
Males	2.4	6.1	15.4	31.3	67.6	16.1
Females	1.5	3.6	9.3	18.0	40.8	9.6
Widowed	3.7	6.6	13.3	23.2	83.3	17.5
Males	4.8	13.0	23.5	37.6	111.9	26.1
Females	3.4	5.3	10.7	19.3	71.3	14.8
Divorced	6.1	12.4	22.6	47.0	118.1	27.7
Males	10.3	20.0	33.6	76.1	133.5	37.4
Females	3.6	6.7	9.5	12.8	85.7	16.2
1971 Atlantic	2.4	5.8	13.7	25.4	74.6	16.0
MALES	3.0	7.9	18.1	34.5	87.1	19.9
FEMALES	1.8	3.7	9.0	16.8	64.7	12.4
Single	4.4	11.2	19.0	27.7	77.0	19.6
Males	5.6	14.0	23.9	39.1	89.4	24.1
Females	2.4	7.1	12.5	15.2	67.4	14.4
Married	2.2	5.1	12.7	25.3	59.9	13.8
Males	2.7	7.0	16.7	32.2	71.2	17.2
Females	1.7	3.2	7.8	16.3	41.2	9.2
Widowed	2.8	7.2	15.1	23.8	90.3	18.6

TABLE B-34
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Males	3.6	14.6	27.6	46.2	130.6	29.9
Females	2.6	5.6	12.2	18.1	77.3	15.5
Divorced	2.7	6.8	20.3	36.0	68.9	17.8
Males	2.1	11.4	30.9	49.0	83.0	23.7
Females	3.1	2.6	9.6	20.0	48.7	11.1
Quebec	2.4	5.9	15.0	27.7	75.3	16.5
MALES	2.9	8.0	20.5	38.0	89.7	21.0
FEMALES	1.8	3.9	9.8	18.9	64.8	12.8
Single	4.4	8.9	17.4	28.6	70.3	18.0
Males	6.1	13.7	28.3	46.7	93.6	26.2
Females	2.6	4.9	10.4	18.2	59.0	12.7
Married	2.0	5.4	14.4	28.0	65.1	15.0
Males	2.5	7.1	18.8	35.1	74.9	18.2
Females	1.6	3.7	9.1	18.6	49.2	10.7
Widowed	2.8	6.2	14.4	25.1	87.5	17.9
Males	4.2	15.1	28.7	49.7	126.8	30.2
Females	2.5	4.4	11.3	19.3	74.9	14.8
Divorced	6.4	15.4	44.7	81.2	185.5	43.8
Males	7.7	23.3	77.0	122.6	261.5	65.1
Females	5.3	9.2	17.1	47.4	117.8	25.5
Ontario	2.2	5.4	13.7	26.3	71.7	15.6
MALES	2.7	7.1	18.7	36.3	88.5	20.0
FEMALES	1.6	3.8	8.9	17.6	60.2	11.9
Single	5.4	9.5	17.8	30.4	72.7	19.0
Males	6.3	12.8	25.4	43.7	95.1	25.4
Females	3.9	5.4	10.5	19.0	59.6	13.5
Married	1.9	5.0	13.0	26.1	60.0	13.8
Males	2.3	6.4	17.4	33.8	73.5	17.4
Females	1.4	3.5	7.8	16.0	39.3	8.9
Widowed	3.4	6.9	15.0	25.0	83.6	17.9
Males	4.4	12.4	30.6	51.4	130.4	30.5
Females	3.1	5.8	12.2	19.7	71.3	15.1
Divorced	4.9	7.9	20.6	32.5	60.4	17.7
Males	7.1	13.1	32.1	50.6	98.6	28.1
Females	3.5	4.0	11.9	18.8	32.0	9.9
Prairies	2.2	4.9	11.3	22.2	71.1	14.6
MALES	2.9	6.4	14.9	28.9	83.7	18.0
FEMALES	1.5	3.3	7.7	15.1	59.5	11.2
Single	5.2	10.1	17.0	28.7	80.7	19.7
Males	6.0	12.5	22.1	35.1	95.6	23.9
Females	3.4	5.7	8.7	16.3	51.5	11.9
Married	1.9	4.2	10.4	21.7	58.8	12.6

TABLE B-34
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Males	2.4	5.4	13.4	27.0	69.1	15.3
Females	1.3	3.0	6.9	14.2	39.9	8.5
Widowed	3.4	6.5	12.3	20.0	84.1	17.0
Males	5.2	15.9	23.3	39.5	125.2	28.7
Females	2.9	4.5	10.3	16.2	71.3	14.0
Divorced	4.7	10.2	16.5	31.7	56.1	16.8
Males	7.6	13.3	23.1	39.2	65.1	21.6
Females	2.6	7.5	10.1	22.2	41.9	11.6
British Columbia	2.5	5.7	12.3	23.2	72.2	15.3
MALES	3.2	7.3	16.4	30.4	87.3	19.1
FEMALES	1.8	4.2	8.3	16.0	59.9	11.8
Single	7.1	11.5	18.2	34.5	80.2	21.4
Males	8.7	15.4	24.8	46.4	99.2	27.5
Females	3.9	5.5	9.9	16.7	55.3	12.7
Married	2.0	5.0	11.3	22.1	59.9	13.2
Males	2.5	6.1	14.9	27.1	72.5	16.3
Females	1.6	3.9	7.2	15.3	38.9	8.9
Widowed	4.9	7.0	13.0	21.6	85.1	18.0
Males	4.8	11.9	25.0	44.4	130.0	28.8
Females	4.9	5.9	10.8	17.0	72.7	15.4
Divorced	7.8	11.4	21.5	29.7	66.8	19.2
Males	7.2	17.1	27.4	39.8	91.7	26.5
Females	2.7	6.9	16.1	18.9	36.9	11.8
1981						
Atlantic	1.8	4.8	12.1	23.1	65.6	13.9
MALES	2.5	6.3	16.3	30.9	79.9	17.8
FEMALES	1.1	3.2	8.1	16.0	55.0	10.7
Single	5.3	9.7	19.0	31.1	73.6	19.4
Males	7.5	12.2	24.0	45.7	93.0	25.3
Females	2.1	5.6	12.1	14.8	59.0	12.9
Married	1.4	4.1	11.1	22.2	54.1	12.0
Males	1.9	5.4	15.0	27.7	67.6	15.3
Females	.9	2.8	7.0	15.2	32.0	7.5
Widowed	4.2	6.7	12.1	22.1	76.3	16.5
Males	7.2	12.2	20.0	43.3	114.4	26.8
Females	3.7	5.7	10.6	17.8	66.6	14.3
Divorced	3.8	9.1	20.2	31.3	75.5	19.2
Males	6.3	14.0	28.2	48.4	96.8	26.8
Females	2.1	4.8	12.2	12.2	53.0	11.7
Quebec	1.8	4.7	12.0	23.2	60.1	13.3
MALES	2.4	6.3	16.7	32.6	76.5	17.5

TABLE B-34
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
FEMALES	1.2	3.2	7.9	15.5	49.4	10.0
Single	4.3	8.6	16.6	26.3	60.1	16.3
Males	6.0	12.7	25.8	45.3	88.9	24.8
Females	2.5	4.7	9.7	16.1	48.9	11.1
Married	1.3	4.1	11.2	23.3	55.4	12.2
Males	1.7	5.2	14.9	29.7	65.7	15.1
Females	.9	2.9	7.1	15.2	39.7	8.4
Widowed	4.1	5.7	12.8	20.4	65.0	14.8
Males	11.9	13.6	29.1	45.0	108.5	30.0
Females	2.6	4.1	9.7	15.5	54.7	11.7
Divorced	3.5	7.6	16.3	30.7	74.5	17.8
Males	5.5	11.5	24.9	43.8	86.5	23.7
Females	2.2	4.5	8.7	17.2	61.7	12.4
Ontario	1.6	4.7	11.6	22.8	64.5	13.6
MALES	1.9	5.9	15.5	31.6	79.0	17.3
FEMALES	1.2	3.4	8.0	15.3	55.1	10.7
Single	3.4	9.0	18.5	29.8	74.3	18.4
Males	4.4	12.3	25.8	45.1	97.1	25.1
Females	2.0	4.5	10.7	17.4	62.3	12.8
Married	1.3	4.1	10.6	21.9	53.4	11.8
Males	1.5	5.0	13.8	28.9	66.3	14.8
Females	1.1	3.1	7.1	13.0	33.8	7.7
Widowed	3.7	7.1	13.6	22.4	74.4	16.5
Males	6.3	13.9	28.4	44.2	117.9	29.1
Females	3.2	5.7	11.0	18.6	65.1	14.0
Divorced	3.9	9.9	18.5	35.9	68.0	18.6
Males	6.0	15.8	29.1	55.1	99.3	28.2
Females	2.6	5.7	10.8	21.5	45.5	11.7
Prairies	1.9	4.5	10.5	21.1	62.9	13.1
MALES	2.4	5.9	13.9	28.1	76.1	16.5
FEMALES	1.4	3.1	7.3	14.7	52.5	10.2
Single	5.4	10.8	17.7	30.1	72.3	19.2
Males	6.3	13.8	23.0	40.4	91.2	24.5
Females	3.9	4.9	8.8	16.2	47.0	11.3
Married	1.4	3.7	9.2	19.8	52.1	11.1
Males	1.8	4.6	11.8	25.0	63.6	13.8
Females	1.1	2.8	6.5	13.6	32.2	7.3
Widowed	3.8	7.7	13.1	19.9	74.0	16.4
Males	5.7	17.4	26.8	41.3	116.4	29.0
Females	3.5	5.6	10.7	16.4	64.5	13.8
Divorced	5.2	9.3	19.0	33.6	64.5	18.4
Males	8.0	15.1	31.8	49.4	92.7	28.0
Females	3.2	4.8	8.3	18.7	31.9	9.3

TABLE B-34
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
British Columbia	1.9	4.6	10.1	18.8	59.6	12.5
MALES	2.4	5.7	13.3	24.6	71.0	15.4
FEMALES	1.4	3.5	7.3	13.6	51.1	10.0
Single	5.5	8.8	17.7	24.4	69.9	18.0
Males	7.3	11.1	24.8	37.9	85.7	23.6
Females	2.5	4.7	8.2	10.9	55.2	11.2
Married	1.4	3.9	9.0	17.9	48.4	10.5
Males	1.6	4.6	11.6	22.2	59.5	12.9
Females	1.2	3.0	6.4	12.8	30.6	7.1
Widowed	3.0	7.6	13.2	19.1	71.9	15.8
Males	3.5	11.0	28.4	39.9	112.3	26.3
Females	2.9	6.8	10.3	15.3	62.9	13.6
Divorced	5.0	10.0	15.0	24.6	59.9	16.4
Males	7.8	15.4	20.9	35.1	80.2	23.2
Females	2.9	5.8	10.8	16.9	41.4	11.0

Rates calculated by: ma=da/pa X 1,000 (where ma = rates, da = the sum of the frequency of deaths for age group a, and pa = the sum of the population for age group a).

Statistics generated through SPSSx.

TABLE B-35

Age-Specific and Standardized Cardiovascular Disease Death Rates (Per 1,000 Pop) for Canadian Regions, by Year, Marital Status and Sex, for Ages 35+

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1951						
Atlantic	.5	1.9	5.2	10.6	29.6	6.1
MALES	.5	2.6	6.9	12.4	31.6	7.0
FEMALES	.5	1.2	3.5	8.6	27.7	5.2
Single	.9	2.8	6.0	14.8	33.2	7.4
Males	.8	3.6	7.6	18.4	36.8	8.6
Females	.9	1.8	3.9	10.3	29.6	5.9
Married	.5	1.7	4.9	9.5	23.7	5.2
Males	.5	2.3	6.4	10.4	25.2	5.9
Females	.4	1.1	3.1	8.1	20.8	4.2
Widowed	.2	2.0	6.2	11.4	34.7	6.9
Males	--	5.1	11.2	17.5	42.7	10.1
Females	.3	.8	4.4	8.9	30.9	5.6
Divorced	1.6	--	16.0	33.9	--	6.4
Males	3.9	--	21.4	25.0	--	7.6
Females	--	--	9.1	52.6	--	6.0
Quebec	.8	2.5	7.0	12.7	34.1	7.4
MALES	1.0	3.6	9.3	15.5	35.7	8.6
FEMALES	.5	1.4	4.6	10.0	32.7	6.2
Single	1.2	2.9	7.9	13.5	38.1	8.4
Males	1.8	4.9	13.1	19.1	42.6	11.1
Females	.8	1.3	4.1	8.9	35.3	6.4
Married	.7	2.5	6.9	12.8	29.8	6.8
Males	.9	3.5	8.7	14.5	30.6	7.7
Females	.5	1.4	4.6	10.4	28.4	5.7
Widowed	1.3	1.3	6.8	12.3	37.3	7.6
Males	2.8	1.8	10.7	17.5	42.5	10.0
Females	.8	1.1	5.2	9.8	34.5	6.5
Divorced	--	1.4	11.5	11.8	40.0	8.4
Males	--	3.5	22.4	20.0	58.8	14.0
Females	--	--	--	--	--	--
Ontario	.7	2.5	7.4	13.4	36.9	7.8
MALES	.9	3.6	10.1	16.6	40.5	9.5
FEMALES	.4	1.2	4.6	10.3	33.8	6.3
Single	1.1	3.2	7.8	12.5	38.2	8.3
Males	1.4	4.7	11.0	16.5	44.8	10.6
Females	.6	1.4	4.8	8.7	33.5	6.2
Married	.6	2.4	7.3	13.3	30.3	7.0
Males	.9	3.4	9.7	15.9	33.7	8.4

TABLE B-35
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Females	.4	1.2	4.3	9.6	24.5	5.0
Widowed	1.1	2.1	7.3	14.2	43.1	8.7
Males	2.4	4.2	13.4	20.4	52.8	12.5
Females	.8	1.5	5.5	11.9	38.8	7.3
Divorced	.9	4.9	20.4	33.3	49.2	14.2
Males	2.0	8.6	28.3	38.7	63.3	19.2
Females	.4	2.3	11.7	25.2	28.3	8.4
Prairies	.5	1.8	5.6	11.0	31.4	6.4
MALES	.7	2.4	7.5	13.2	34.3	7.5
FEMALES	.4	.9	3.3	8.0	27.8	5.0
Single	.8	2.8	7.7	14.7	31.9	7.5
Males	.9	3.4	8.5	16.2	34.5	8.3
Females	.5	1.1	4.8	8.2	23.0	4.8
Married	.5	1.6	5.4	10.3	25.6	5.5
Males	.6	2.2	7.2	12.0	28.4	6.6
Females	.3	.9	3.0	7.6	20.2	4.0
Widowed	1.1	1.9	5.2	11.4	38.4	7.4
Males	1.9	4.8	8.2	17.0	47.3	10.6
Females	.9	1.0	4.1	8.7	33.3	6.1
Divorced	.9	3.8	7.8	29.7	75.9	14.3
Males	2.4	6.2	12.8	34.5	82.9	17.7
Females	--	1.3	--	15.2	46.5	7.1
British Columbia	.6	2.1	6.2	11.9	33.1	6.9
MALES	.8	2.8	8.1	15.2	36.4	8.2
FEMALES	.4	1.3	4.0	7.8	29.0	5.4
Single	.7	2.1	8.2	13.8	36.8	7.1
Males	1.1	2.9	9.5	15.9	40.6	9.2
Females	.1	.5	4.8	6.8	26.9	4.9
Married	.5	2.0	5.8	11.4	27.7	6.1
Males	.7	2.7	7.7	14.4	30.7	7.3
Females	.4	1.2	3.5	6.6	22.3	4.3
Widowed	.7	2.9	6.1	12.0	38.8	7.8
Males	--	6.9	8.8	17.1	47.7	10.6
Females	.9	1.9	5.3	10.0	34.2	6.7
Divorced	1.6	4.5	17.0	35.3	62.0	15.3
Males	2.2	5.6	19.5	48.5	75.8	19.0
Females	1.3	3.4	13.7	9.4	26.3	7.9
1961						
Atlantic	.5	1.9	5.5	11.6	32.4	6.6
MALES	.7	2.9	8.2	14.6	35.8	8.1
FEMALES	.3	.9	2.8	8.6	29.2	5.1

TABLE B-35
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Single	.9	2.7	7.0	12.9	36.4	7.8
Males	1.3	4.0	9.5	16.5	43.1	9.8
Females	.3	.8	3.9	8.8	30.2	5.4
Married	.4	1.8	5.4	11.3	26.1	5.7
Males	.6	2.7	7.8	13.5	30.1	7.1
Females	.2	.8	2.5	8.2	18.8	3.7
Widowed	.8	1.6	5.0	12.0	38.6	7.3
Males	2.3	3.5	10.6	20.0	47.0	11.0
Females	.4	1.1	3.2	9.3	35.1	6.0
Divorced	1.9	5.5	6.0	21.5	45.9	10.5
Males	3.3	5.4	8.7	26.3	31.3	10.1
Females	--	5.7	--	--	153.9	20.0
Quebec	.6	2.4	6.9	13.4	35.0	7.5
MALES	1.0	3.6	9.8	17.1	38.4	9.2
FEMALES	.2	1.1	4.0	9.9	32.1	5.8
Single	.9	2.6	6.9	14.8	36.7	8.0
Males	1.5	4.5	12.1	22.7	49.4	11.8
Females	.4	1.2	3.4	9.8	29.6	5.5
Married	.6	2.4	6.9	13.2	30.5	6.9
Males	1.0	3.5	9.5	16.6	32.8	8.4
Females	.2	1.1	3.8	8.7	26.7	5.0
Widowed	.3	1.9	6.3	13.1	39.4	7.6
Males	.8	3.9	10.8	16.2	46.7	10.3
Females	.1	1.3	4.8	12.0	36.0	6.6
Divorced	.6	--	3.6	13.8	40.2	6.9
Males	1.8	--	8.5	24.2	51.6	10.4
Females	--	--	--	--	26.0	3.1
Ontario	.6	2.4	6.6	13.6	36.3	7.6
MALES	.9	3.8	9.7	18.3	42.4	9.8
FEMALES	.2	1.0	3.4	9.3	31.4	5.5
Single	.9	3.2	8.0	12.6	36.3	8.1
Males	1.3	5.2	12.2	18.7	42.8	10.8
Females	.4	.9	3.4	7.1	32.1	5.5
Married	.5	2.3	6.5	13.9	30.6	6.9
Males	.9	3.6	9.3	17.6	36.3	8.8
Females	.2	.9	3.2	9.0	21.4	4.2
Widowed	.6	2.1	5.6	12.9	42.2	8.0
Males	3.1	4.1	11.0	21.6	56.6	12.8
Females	--	1.7	4.2	10.4	36.8	6.5
Divorced	2.4	4.0	12.1	26.8	62.9	13.9
Males	4.2	7.7	20.3	37.0	82.8	20.3
Females	1.3	1.6	5.5	16.3	38.2	7.8

TABLE B-35
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Prairies	.4	1.7	4.6	10.1	28.7	5.7
MALES	.6	2.6	6.6	12.9	33.4	7.2
FEMALES	.2	.7	2.3	7.0	23.1	4.0
Single	.7	2.5	6.7	13.4	35.2	7.5
Males	.9	3.4	8.3	14.9	39.7	8.8
Females	.3	.9	3.1	9.3	20.7	4.2
Married	.4	1.6	4.5	9.9	23.8	5.1
Males	.6	2.5	6.4	12.4	28.2	6.5
Females	.2	.6	2.2	6.3	15.2	3.0
Widowed	.3	1.2	3.0	9.1	33.6	5.8
Males	--	2.7	6.2	13.2	44.3	8.3
Females	.4	.8	2.2	7.9	28.5	4.8
Divorced	1.0	1.8	6.8	17.6	57.5	10.5
Males	2.4	3.2	7.6	22.4	55.0	11.5
Females	--	.7	5.8	7.0	65.0	9.7
British Columbia	.5	1.9	5.5	11.4	32.3	6.5
MALES	.8	3.0	7.7	15.3	36.7	8.2
FEMALES	.2	.8	3.2	7.6	27.5	4.8
Single	.7	3.5	7.1	13.9	33.9	7.7
Males	.8	5.5	8.7	16.6	37.9	9.3
Females	.5	.7	3.9	8.6	25.2	4.8
Married	.5	1.8	5.3	11.5	26.4	5.8
Males	.7	2.8	7.2	14.8	30.9	7.3
Females	.2	.7	2.9	7.1	18.3	3.6
Widowed	--	1.3	4.9	9.7	39.5	6.8
Males	--	2.2	9.5	14.6	52.3	9.9
Females	--	1.1	3.7	8.3	34.1	5.8
Divorced	1.6	3.0	13.5	21.5	49.1	11.6
Males	1.7	4.8	18.8	39.9	63.4	16.3
Females	1.6	1.6	7.1	--	19.1	4.6
1971						
Atlantic	.5	1.9	5.3	10.9	31.5	6.4
MALES	.8	3.1	8.1	15.4	37.9	8.5
FEMALES	.3	.6	2.4	6.6	26.4	4.4
Single	.7	3.2	7.7	11.3	31.4	7.3
Males	1.0	4.4	10.4	18.5	38.1	9.6
Females	.1	1.4	4.2	3.6	26.1	4.7
Married	.5	1.7	5.0	11.5	25.3	5.6
Males	.7	2.8	7.5	14.3	31.1	7.3
Females	.3	.5	2.0	7.7	15.8	3.1
Widowed	.3	2.1	5.0	8.8	38.4	7.0

TABLE B-35
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Males	--	6.1	12.8	21.0	57.0	12.6
Females	.4	1.2	3.3	5.7	32.3	5.4
Divorced	.5	3.1	9.1	10.4	34.2	7.7
Males	1.2	6.5	13.4	4.8	38.3	9.7
Females	--	--	4.6	17.1	28.6	5.7
Quebec	.5	2.0	5.7	11.2	30.7	6.4
MALES	.8	3.3	8.8	16.0	36.3	8.5
FEMALES	.2	.8	2.9	7.1	26.7	4.6
Single	.8	2.9	6.2	11.1	27.5	6.5
Males	1.3	5.3	11.9	19.8	37.2	10.2
Females	.4	.9	2.5	6.0	22.9	4.1
Married	.5	1.9	5.7	11.6	26.2	5.9
Males	.7	3.0	8.1	14.8	30.3	7.4
Females	.2	.8	2.8	7.4	19.7	3.8
Widowed	.6	1.6	4.9	9.7	36.5	6.7
Males	2.1	6.3	10.6	20.8	52.2	12.4
Females	.2	.6	3.6	7.1	31.5	5.3
Divorced	.8	4.4	17.8	30.4	68.1	15.5
Males	1.8	6.5	34.8	48.4	86.2	23.4
Females	--	2.7	3.2	15.8	52.1	8.8
Ontario	.4	1.8	5.4	11.2	32.0	5.5
MALES	.7	3.0	8.5	16.2	38.4	8.6
FEMALES	.1	.6	2.5	6.8	27.7	4.6
Single	1.0	2.6	6.1	12.9	32.1	7.1
Males	1.3	4.2	9.7	19.7	42.7	10.2
Females	.4	.7	2.8	7.0	25.9	4.5
Married	.4	1.7	5.4	11.2	25.9	5.6
Males	.6	2.8	8.1	15.0	31.5	7.5
Females	.1	.6	2.2	6.2	17.2	3.2
Widowed	.2	1.7	5.0	10.2	38.3	6.9
Males	.4	5.5	14.4	22.8	56.9	13.1
Females	.1	.9	3.3	7.7	33.4	5.5
Divorced	.9	2.1	7.3	13.3	25.3	6.4
Males	1.6	4.5	13.1	25.8	43.8	11.6
Females	.5	.3	2.9	3.9	11.6	2.5
Prairies	.4	1.5	3.9	8.5	27.9	5.3
MALES	.6	2.4	5.9	11.5	33.1	6.9
FEMALES	.1	.6	1.7	5.3	23.0	3.7
Single	.6	2.9	5.4	9.9	31.2	6.6
Males	.8	4.2	7.9	13.2	37.7	8.5
Females	.2	.6	1.3	3.5	18.4	3.0
Married	.3	1.3	3.7	8.6	23.3	4.7

TABLE B-35
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Males	.6	2.1	5.5	10.9	27.6	6.0
Females	.1	.5	1.6	5.4	15.4	2.8
Widowed	--	1.7	3.7	7.0	32.7	5.7
Males	--	6.1	8.9	13.4	48.8	10.3
Females	--	.8	2.7	5.7	27.7	4.5
Divorced	.8	2.8	4.3	11.3	22.1	5.4
Males	1.7	4.2	7.2	19.0	26.2	7.8
Females	.2	1.7	1.5	1.6	15.5	2.8
British Columbia	.4	1.5	4.2	8.6	29.0	5.5
MALES	.6	2.5	6.6	12.4	34.7	7.3
FEMALES	.1	.6	1.8	4.8	24.5	3.9
Single	.8	1.8	4.8	11.3	30.7	6.3
Males	.9	2.6	7.4	16.8	38.2	8.4
Females	.5	.5	1.6	3.1	20.7	3.4
Married	.3	1.4	4.0	8.7	24.0	4.9
Males	.6	2.4	6.2	11.5	28.8	6.4
Females	.1	.5	1.5	4.9	16.1	2.8
Widowed	.3	1.3	4.0	6.5	34.6	5.9
Males	--	2.4	9.3	14.8	52.5	10.0
Females	.4	1.1	3.0	4.8	29.7	5.0
Divorced	.6	2.6	7.6	12.1	28.4	6.8
Males	1.3	4.1	12.4	17.5	35.2	9.6
Females	--	1.5	3.4	6.3	20.1	4.0
1981 Atlantic	.4	1.4	4.4	9.0	27.2	5.4
MALES	.6	2.3	6.9	12.8	31.9	7.0
FEMALES	.1	.6	2.2	5.5	23.8	3.9
Single	1.3	3.0	6.7	13.0	31.6	7.4
Males	1.9	4.5	9.3	19.3	39.5	9.9
Females	.3	.7	3.1	5.9	25.7	4.5
Married	.3	1.2	4.3	8.5	21.8	4.6
Males	.5	2.0	6.6	11.3	26.8	6.1
Females	.1	.5	1.8	5.0	13.8	2.6
Widowed	.4	2.1	3.6	8.6	32.1	5.9
Males	--	4.1	6.5	19.6	45.0	9.3
Females	.4	1.7	3.1	6.4	28.8	5.2
Divorced	.7	2.4	6.1	12.4	31.5	6.8
Males	1.7	3.7	8.4	20.3	38.7	9.5
Females	--	1.2	3.9	3.5	23.9	4.2
Quebec	.4	1.4	4.1	8.7	23.5	4.8
MALES	.6	2.3	6.3	12.7	29.3	6.6

TABLE B-35
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
FEMALES	.1	.6	2.2	5.5	19.8	3.5
Single	1.0	2.3	5.2	10.2	22.4	5.4
Males	1.6	3.8	9.3	17.9	31.7	8.6
Females	.3	.8	2.1	6.0	18.7	3.4
Married	.3	1.3	4.0	8.9	21.9	4.6
Males	.5	2.0	5.8	11.6	25.5	5.8
Females	.1	.5	2.1	5.4	16.3	3.0
Widowed	.4	1.5	3.7	7.6	25.7	5.0
Males	1.4	4.6	8.3	18.0	41.4	9.7
Females	.3	.9	2.8	5.5	22.0	4.0
Divorced	.4	2.4	5.2	8.5	23.1	5.2
Males	.9	4.1	8.2	14.0	26.4	7.3
Females	.1	1.1	2.5	2.9	19.5	3.4
Ontario	.3	1.4	3.9	8.5	26.5	5.1
MALES	.5	2.2	6.1	12.8	31.4	6.7
FEMALES	.1	.5	1.9	4.8	23.3	3.7
Single	.6	2.5	5.4	10.1	30.5	6.4
Males	.9	3.8	8.5	16.6	38.2	8.9
Females	.1	.7	2.1	4.8	26.5	4.2
Married	.3	1.2	3.7	8.4	21.4	4.4
Males	.4	1.9	5.7	11.9	26.6	5.9
Females	.1	.5	1.6	4.0	13.4	2.4
Widowed	.6	1.7	4.1	7.8	31.3	5.8
Males	1.9	4.4	10.8	16.6	46.6	10.9
Females	.4	1.1	2.9	6.2	28.0	4.8
Divorced	.6	3.1	5.4	13.1	22.5	5.8
Males	1.3	6.3	10.0	22.0	28.7	9.3
Females	.1	.9	2.0	6.5	18.1	3.4
Prairies	.3	1.2	3.4	7.5	25.0	4.7
MALES	.5	2.0	5.3	11.1	30.3	6.3
FEMALES	.1	.4	1.6	4.3	20.7	3.3
Single	.9	2.7	5.5	10.8	27.9	6.3
Males	1.1	3.8	7.8	16.2	36.0	8.5
Females	.4	.4	1.8	3.5	17.1	2.9
Married	.2	1.0	3.1	7.3	20.4	4.0
Males	.4	1.7	4.7	9.9	25.2	5.3
Females	.1	.4	1.5	4.0	12.2	2.2
Widowed	.2	1.2	3.2	6.5	29.9	5.1
Males	--	3.7	9.2	16.4	47.9	9.8
Females	.3	.7	2.1	4.9	25.8	4.2
Divorced	.6	2.6	6.2	10.5	22.9	5.7
Males	1.2	5.2	11.8	16.7	32.0	9.3
Females	.1	.5	1.5	4.7	12.3	2.3

TABLE B-35
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
British Columbia	.3	1.1	3.2	6.3	23.8	4.4
MALES	.4	1.8	5.0	9.5	27.7	5.7
FEMALES	.1	.4	1.5	3.6	20.9	3.3
Single	.3	1.7	5.2	9.3	27.7	5.6
Males	.5	2.4	8.2	15.9	33.3	7.7
Females	.1	.4	1.1	2.7	22.4	3.3
Married	.2	1.0	3.0	6.1	18.6	3.7
Males	.3	1.6	4.6	8.6	23.3	4.9
Females	.1	.3	1.4	3.2	11.1	2.0
Widowed	.3	1.7	3.0	5.7	29.6	5.1
Males	--	3.1	6.4	13.2	43.9	8.4
Females	.4	1.3	2.3	4.3	26.4	4.5
Divorced	.5	2.4	4.1	9.5	20.3	4.8
Males	.8	4.4	7.3	13.9	28.2	7.4
Females	.3	.8	1.9	6.2	13.1	2.7

Rates calculated by: ma=da/pa X 1,000 (where ma = rates, da = the sum of the frequency of deaths for age group a, and pa = the sum of the population for age group a).

Statistics generated through SPSSx.

TABLE B-36

Age-Specific and Standardized Malignant Neoplasm Death Rates (Per 1,000 Pop) for Canadian Regions, by Year, Marital Status and Sex, for Ages 35+

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1951						
Atlantic	.5	1.5	3.6	5.8	10.2	2.9
MALES	.4	1.4	3.5	6.6	10.4	3.0
FEMALES	.5	1.7	3.6	5.1	10.0	2.9
Single	.4	2.3	4.7	7.3	9.2	3.4
Males	.4	2.8	3.9	6.4	8.9	3.2
Females	.5	1.6	5.7	8.5	9.4	3.5
Married	.5	1.4	3.3	5.5	9.3	2.7
Males	.4	1.1	3.4	6.4	9.7	2.8
Females	.5	1.6	3.3	4.1	8.6	2.6
Widowed	1.0	2.2	3.8	6.2	11.3	3.5
Males	1.7	2.3	4.6	7.5	12.4	4.2
Females	.7	2.1	3.5	5.7	10.7	3.2
Divorced	2.8	--	21.7	--	--	5.3
Males	--	--	26.7	--	--	5.3
Females	4.6	--	15.9	--	--	4.7
Quebec	.7	1.8	4.1	7.3	12.3	3.6
MALES	.4	1.5	4.1	8.1	13.7	3.6
FEMALES	1.0	2.1	4.0	6.6	11.1	3.5
Single	.8	1.8	5.2	7.0	11.7	3.8
Males	.6	1.5	5.7	7.7	11.1	3.7
Females	1.0	2.0	4.9	6.5	12.1	3.8
Married	.6	1.8	3.9	7.2	12.4	3.5
Males	.3	1.5	3.8	8.0	12.7	3.4
Females	.9	2.1	3.9	6.1	12.0	3.6
Widowed	1.0	2.0	4.2	7.7	12.3	3.8
Males	.8	2.4	4.9	8.7	16.0	4.5
Females	1.1	1.9	3.9	7.3	10.3	3.5
Divorced	1.2	4.2	--	--	30.0	5.1
Males	--	7.0	--	--	29.4	5.3
Females	1.7	2.4	--	--	31.3	5.0
Ontario	.6	1.6	3.8	6.1	10.2	3.1
MALES	.3	1.3	4.0	6.8	11.7	3.2
FEMALES	.8	1.8	3.7	5.3	8.9	2.9
Single	.6	2.2	4.7	6.1	10.4	3.4
Males	.4	1.8	4.6	6.4	11.3	3.4
Females	.8	2.6	4.7	5.9	9.8	3.5
Married	.5	1.5	3.6	5.8	9.9	2.9
Males	.3	1.2	3.8	6.3	10.9	3.0

TABLE B-36
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Females	.7	1.8	3.4	5.2	8.1	2.8
Widowed	1.1	1.8	4.5	6.5	10.4	3.5
Males	1.0	2.5	5.8	10.0	13.3	4.5
Females	1.1	1.6	4.1	5.2	9.1	3.1
Divorced	.9	1.6	4.7	16.7	11.4	4.4
Males	--	1.6	7.4	22.1	19.0	5.9
Females	1.4	1.7	1.7	8.4	--	1.9
Prairies	.5	1.5	3.3	5.2	10.1	2.9
MALES	.4	1.3	3.4	5.6	11.4	2.9
FEMALES	.7	1.8	3.3	4.7	8.6	2.8
Single	.5	1.5	4.2	5.5	9.8	3.0
Males	.3	1.2	3.7	5.6	10.7	2.9
Females	.8	2.3	5.9	5.0	6.6	3.2
Married	.5	1.5	3.2	5.0	9.7	2.8
Males	.4	1.3	3.3	5.4	10.6	2.8
Females	.7	1.7	3.0	4.3	7.8	2.6
Widowed	.2	1.8	3.5	5.9	10.8	3.0
Males	--	1.5	3.6	6.6	13.4	3.2
Females	.2	1.9	3.5	5.5	9.2	2.8
Divorced	1.7	3.1	6.4	16.4	18.9	6.2
Males	1.2	3.7	7.3	19.7	16.6	6.4
Females	2.3	2.1	4.2	--	32.3	6.0
British Columbia	.4	1.6	3.5	5.5	9.8	2.9
MALES	.3	1.1	3.6	6.1	11.3	2.9
FEMALES	.4	2.2	3.4	4.8	8.1	2.7
Single	.7	1.7	4.2	7.6	11.0	3.4
Males	.8	1.4	3.5	7.8	12.0	3.4
Females	.5	2.3	6.0	6.8	8.6	3.6
Married	.3	1.4	3.2	5.2	9.0	2.6
Males	.3	1.0	3.4	5.6	10.1	2.7
Females	.4	1.9	3.0	4.6	6.7	2.4
Widowed	.4	4.2	3.9	5.3	10.7	3.7
Males	--	3.1	4.2	6.6	13.8	3.8
Females	.4	4.4	3.8	4.7	9.0	3.5
Divorced	.8	.6	9.0	16.0	11.0	4.8
Males	1.1	1.1	12.4	19.4	15.2	6.5
Females	.6	--	4.6	9.4	--	1.9
1961						
Atlantic	.6	1.5	3.8	6.1	10.6	3.1
MALES	.4	1.3	4.1	7.0	12.8	3.4
FEMALES	.7	1.8	3.5	5.3	8.7	2.9

TABLE B-36
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Single	.5	2.1	4.1	5.9	11.8	3.4
Males	.5	1.8	4.6	6.0	15.0	3.8
Females	.6	2.4	3.6	5.8	8.8	3.1
Married	.5	1.4	3.7	5.5	9.7	2.9
Males	.4	1.1	4.0	6.3	11.2	3.1
Females	.7	1.7	3.3	4.3	7.0	2.5
Widowed	1.6	1.5	4.2	8.1	11.4	3.8
Males	2.3	1.0	4.6	12.1	15.5	4.8
Females	1.4	1.7	4.1	6.8	9.7	3.4
Divorced	1.3	8.7	6.6	16.5	22.4	8.0
Males	--	10.8	4.3	26.3	31.3	9.5
Females	2.0	6.9	8.8	--	--	4.2
Quebec	.5	1.7	4.1	7.7	13.9	3.7
MALES	.4	1.5	4.5	9.7	16.7	4.2
FEMALES	.7	1.8	3.7	5.8	11.3	3.2
Single	.7	2.1	4.1	8.6	14.1	3.7
Males	.5	1.6	4.3	12.4	16.9	4.5
Females	.8	2.4	4.0	6.1	12.5	3.7
Married	.5	1.6	4.0	7.8	13.7	3.6
Males	.4	1.5	4.5	9.3	15.6	4.0
Females	.7	1.7	3.4	5.8	10.4	3.0
Widowed	.6	2.4	4.5	6.7	14.0	3.9
Males	--	2.8	5.2	9.6	19.0	4.8
Females	.7	2.3	4.2	5.6	11.6	3.5
Divorced	--	2.7	4.7	9.2	23.0	5.1
Males	--	3.4	5.6	16.1	30.9	7.0
Females	--	2.3	4.1	--	13.0	3.0
Ontario	.5	1.6	3.8	6.2	11.0	3.2
MALES	.4	1.4	4.4	7.7	13.8	3.6
FEMALES	.6	1.7	3.2	4.9	8.8	2.7
Single	.6	2.0	4.4	7.1	11.4	3.5
Males	.5	1.6	5.4	9.0	14.1	4.1
Females	.8	2.4	3.2	5.4	9.7	3.1
Married	.5	1.5	3.6	6.2	10.4	3.0
Males	.4	1.3	4.2	7.4	12.4	3.4
Females	.6	1.6	3.0	4.7	7.2	2.5
Widowed	.5	1.8	4.1	5.7	11.5	3.3
Males	--	2.2	5.5	8.0	17.1	4.4
Females	.6	1.7	3.7	5.0	9.5	2.9
Divorced	1.3	2.6	7.3	13.4	18.7	5.9
Males	1.7	4.3	9.5	18.5	18.4	7.2
Females	1.0	1.6	5.5	8.2	19.1	4.8

TABLE B-36
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Prairies	.4	1.4	3.3	5.8	10.4	2.9
MALES	.3	1.3	3.7	6.8	12.6	3.2
FEMALES	.5	1.5	2.9	4.8	7.7	2.4
Single	.7	1.4	4.1	7.2	11.6	3.4
Males	.7	1.3	3.9	8.7	12.5	3.6
Females	.6	1.5	4.6	3.6	8.8	2.8
Married	.4	1.4	3.2	5.6	10.0	2.8
Males	.3	1.3	3.6	6.6	11.5	3.1
Females	.5	1.4	2.6	4.3	7.1	2.2
Widowed	.5	1.5	3.8	5.8	10.5	3.0
Males	--	.8	3.9	5.7	15.7	3.3
Females	.7	1.7	3.8	5.8	8.1	2.8
Divorced	.7	2.9	3.7	8.8	18.5	3.9
Males	.8	2.4	5.4	9.6	22.0	5.4
Females	.6	3.3	1.5	7.0	8.1	2.9
British Columbia	.6	1.4	3.4	5.7	10.9	3.0
MALES	.4	1.2	3.6	7.2	13.5	3.4
FEMALES	.7	1.6	3.1	4.3	8.1	2.6
Single	.8	1.5	3.9	5.5	11.2	3.2
Males	.7	1.3	4.4	7.0	11.8	3.4
Females	1.0	1.8	2.8	2.5	9.8	2.8
Married	.5	1.3	3.2	6.1	10.8	3.0
Males	.4	1.1	3.4	7.4	13.1	3.3
Females	.7	1.6	3.0	4.5	6.5	2.4
Widowed	1.5	2.0	3.9	4.5	10.6	3.5
Males	--	2.9	4.3	5.4	15.0	3.8
Females	1.9	1.8	3.8	4.3	8.8	3.3
Divorced	.3	2.1	2.7	9.8	27.6	5.3
Males	.9	2.8	3.0	14.5	27.2	6.0
Females	--	1.6	2.4	4.3	28.6	4.6
1971						
Atlantic	.6	1.7	4.0	6.8	11.4	3.3
MALES	.5	1.8	4.3	9.0	14.3	3.9
FEMALES	.7	1.7	3.6	4.6	9.1	2.8
Single	.7	2.3	4.5	6.0	11.6	3.6
Males	.8	2.4	4.5	6.6	13.4	3.9
Females	.6	2.2	4.4	5.4	10.2	3.3
Married	.6	1.6	3.8	7.1	11.1	3.3
Males	.5	1.7	4.2	9.2	12.9	3.7
Females	.7	1.6	3.3	4.2	8.2	2.6
Widowed	.6	2.2	4.8	6.0	11.7	3.6

TABLE B-36
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Males	--	2.4	5.7	8.8	18.7	4.7
Females	.7	2.2	4.6	5.2	9.4	3.3
Divorced	.7	1.3	3.8	15.9	14.5	4.3
Males	--	1.1	4.5	23.8	17.0	5.1
Females	1.4	1.5	2.5	--	9.1	2.5
Quebec	.6	1.8	4.5	7.7	14.3	3.9
MALES	.5	1.9	5.4	10.4	18.4	4.8
FEMALES	.7	1.7	3.7	5.4	11.3	3.2
Single	.7	2.1	4.7	7.3	13.2	3.9
Males	.7	1.9	5.0	9.8	18.6	4.7
Females	.7	2.2	4.5	5.9	10.5	3.4
Married	.6	1.7	4.5	8.0	14.0	3.8
Males	.5	1.8	5.3	10.2	16.6	4.5
Females	.7	1.6	3.5	5.1	9.9	2.9
Widowed	1.2	2.2	4.3	6.5	14.8	4.1
Males	1.0	2.5	7.3	11.7	22.9	6.1
Females	1.2	2.1	3.6	5.3	12.2	3.6
Divorced	2.1	5.1	10.2	26.1	39.1	10.9
Males	2.7	6.5	13.3	35.5	49.2	14.0
Females	1.7	4.1	7.6	18.4	30.1	8.2
Ontario	.5	1.5	3.9	6.9	11.4	3.3
MALES	.4	1.4	4.6	9.0	15.9	4.0
FEMALES	.6	1.6	3.3	5.0	8.4	2.7
Single	.8	2.1	4.7	7.3	10.3	3.6
Males	.6	2.1	5.6	8.0	13.8	4.2
Females	1.2	2.0	3.9	6.7	8.3	3.2
Married	.5	1.4	3.8	6.9	11.7	3.2
Males	.4	1.4	4.4	8.8	14.8	3.8
Females	.6	1.5	3.0	4.4	6.8	2.4
Widowed	.7	2.0	4.4	6.6	11.4	3.5
Males	1.2	.9	5.4	11.8	20.0	5.0
Females	.6	2.2	4.2	5.6	9.2	3.1
Divorced	.7	1.6	5.2	8.1	9.8	3.5
Males	.4	1.6	6.1	11.2	17.4	4.7
Females	.9	1.6	4.5	5.8	4.1	2.6
Prairies	.4	1.4	3.5	6.3	11.4	3.1
MALES	.5	1.4	4.0	7.9	14.9	3.7
FEMALES	.4	1.4	3.0	4.6	8.3	2.5
Single	.7	2.2	4.3	8.3	12.1	3.8
Males	.7	2.0	4.9	9.1	14.2	4.2
Females	.6	2.5	3.4	6.7	7.8	3.0
Married	.4	1.3	3.4	6.1	11.4	3.0

TABLE B-36
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
Males	.4	1.4	3.9	7.5	13.8	3.5
Females	.4	1.3	2.8	4.3	6.9	2.2
Widowed	.2	2.1	3.9	5.6	11.4	3.2
Males	--	2.0	5.2	11.0	19.0	4.7
Females	.3	2.2	3.6	4.6	9.0	2.8
Divorced	.2	2.2	3.9	11.3	9.0	3.4
Males	--	1.4	4.2	10.1	7.8	2.9
Females	.4	2.8	3.7	12.7	10.9	3.9
British Columbia	.5	1.4	3.6	6.3	12.1	3.2
MALES	.4	1.2	4.2	7.5	15.6	3.7
FEMALES	.5	1.7	3.1	5.0	9.2	2.7
Single	.7	2.5	5.0	7.3	14.1	4.2
Males	.9	2.8	5.6	8.9	16.7	4.8
Females	.5	2.0	4.4	4.9	10.8	3.2
Married	.4	1.4	3.4	6.2	11.6	3.1
Males	.3	1.1	4.1	7.0	14.4	3.5
Females	.5	1.6	2.7	5.1	7.0	2.4
Widowed	.6	1.5	4.1	6.0	12.1	3.4
Males	--	.6	4.0	11.2	18.8	4.1
Females	.8	1.7	4.1	4.9	10.2	3.2
Divorced	.5	1.3	4.5	7.3	13.7	3.6
Males	.8	1.4	3.8	9.4	16.7	4.1
Females	.2	1.3	5.2	5.0	10.1	3.0
1981						
Atlantic	.5	1.7	4.1	7.1	12.2	3.5
MALES	.5	1.8	5.0	9.1	16.8	4.4
FEMALES	.5	1.5	3.4	5.3	8.8	2.7
Single	.6	2.2	5.2	6.8	12.4	3.9
Males	.8	2.2	6.3	10.3	16.9	4.9
Females	.4	2.2	3.8	3.0	9.0	2.8
Married	.5	1.6	3.9	7.4	12.5	3.4
Males	.5	1.7	4.8	8.7	15.7	4.1
Females	.5	1.4	3.0	5.7	7.2	2.4
Widowed	2.1	2.1	4.6	6.2	11.7	4.1
Males	--	1.6	5.6	10.0	19.7	4.7
Females	2.5	2.1	4.4	5.4	9.7	3.9
Divorced	1.0	2.9	5.9	8.5	17.2	5.0
Males	1.2	3.3	5.9	12.5	27.4	6.7
Females	.9	2.4	5.9	3.7	5.5	3.0
Quebec	.4	1.6	4.4	7.7	13.1	3.6
MALES	.4	1.7	5.6	10.4	18.6	4.8

TABLE B-36
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
FEMALES	.4	1.5	3.4	5.5	9.5	2.8
Single	.6	2.5	5.3	7.6	12.4	4.0
Males	.7	2.8	6.5	11.5	20.1	5.6
Females	.5	2.2	4.4	5.6	9.4	3.2
Married	.4	1.5	4.2	7.9	13.6	3.6
Males	.4	1.5	5.2	9.8	16.9	4.4
Females	.4	1.4	3.1	5.6	8.5	2.6
Widowed	1.3	2.0	4.8	6.5	12.6	4.0
Males	2.8	3.5	9.6	13.2	23.8	7.7
Females	1.1	1.7	3.9	5.1	9.9	3.2
Divorced	.8	2.3	5.4	11.9	19.3	5.2
Males	.9	3.1	8.2	16.3	19.8	6.4
Females	.8	1.7	3.0	7.5	18.8	4.1
Ontario	.4	1.7	4.3	7.1	12.3	3.5
MALES	.4	1.6	4.9	9.2	17.0	4.3
FEMALES	.5	1.7	3.7	5.4	9.3	2.9
Single	.5	2.6	5.8	7.4	12.6	4.1
Males	.4	2.9	6.8	9.2	17.2	5.0
Females	.6	2.2	4.7	6.0	10.2	3.4
Married	.4	1.6	4.0	7.2	12.5	3.4
Males	.3	1.5	4.6	9.1	15.6	4.0
Females	.5	1.6	3.4	4.9	7.6	2.6
Widowed	1.0	2.3	5.0	6.6	11.9	3.9
Males	1.3	2.4	7.3	10.0	20.9	5.8
Females	.9	2.2	4.5	6.0	10.0	3.5
Divorced	.8	2.3	5.7	8.4	18.4	4.9
Males	.9	2.3	7.4	11.4	29.7	6.9
Females	.7	2.3	4.5	6.2	10.3	3.4
Prairies	.4	1.3	3.7	6.6	12.3	3.2
MALES	.3	1.2	4.1	7.6	16.4	3.8
FEMALES	.5	1.4	3.4	5.7	9.0	2.7
Single	.7	2.1	5.5	7.8	13.5	4.1
Males	.5	2.3	6.3	8.2	15.8	4.5
Females	1.2	1.9	4.1	7.3	10.4	3.6
Married	.4	1.1	3.3	6.5	12.4	2.4
Males	.3	1.1	3.7	7.6	15.4	3.6
Females	.4	1.2	2.9	5.2	7.3	2.3
Widowed	.7	2.5	5.1	6.4	11.7	3.8
Males	--	4.1	5.1	7.9	20.1	5.1
Females	.9	2.2	5.2	6.2	9.8	3.6
Divorced	.6	1.9	5.0	6.4	15.9	4.1
Males	.5	1.7	6.4	7.2	23.3	5.3
Females	.7	2.1	3.8	5.7	7.3	2.9

TABLE B-36
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
British Columbia	.5	1.5	3.6	6.3	12.2	3.2
MALES	.4	1.4	4.0	7.3	16.3	3.8
FEMALES	.5	1.6	3.3	5.5	9.1	2.8
Single	.6	1.9	4.8	4.8	14.1	3.7
Males	.6	1.7	6.6	7.1	18.0	4.7
Females	.6	2.1	2.3	2.4	10.5	2.7
Married	.4	1.4	3.4	6.3	12.1	3.1
Males	.3	1.3	3.6	6.8	14.6	3.5
Females	.5	1.5	3.1	5.7	8.0	2.6
Widowed	.3	2.7	5.0	6.5	11.8	3.8
Males	--	1.8	9.6	11.5	21.9	5.9
Females	.4	3.0	4.2	5.6	9.6	3.3
Divorced	.7	1.9	4.3	8.1	15.7	4.1
Males	1.1	2.5	4.3	11.1	19.1	5.0
Females	.4	1.4	4.4	5.8	12.6	3.4

Rates calculated by: ma=da/pa X 1,000 (where ma = rates, da = the sum of the frequency of deaths for age group a, and pa = the sum of the population for age group a).

Statistics generated through SPSSx.

TABLE B-37

Age-Specific, Cause-Specific General Death Rates and Standardized Death Rates (Per 1,000 Pop) for Canada, by Year and Sex, for Ages 35+

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1951						
HEART	.7	2.3	6.6	12.3	34.0	7.2
Males	.9	3.2	8.8	15.0	36.7	8.5
Females	.4	1.2	4.2	9.3	31.4	5.8
CANCER	.6	1.6	3.7	6.1	10.6	3.1
Males	.4	1.4	3.8	6.7	11.8	3.2
Females	.8	1.9	3.6	5.4	9.4	3.0
ALL OTHER	1.6	2.9	6.2	11.6	38.0	8.0
Males	2.0	3.5	7.2	12.9	39.0	8.7
Females	1.3	2.3	5.1	10.0	37.0	7.3
ALL	2.8	6.8	16.5	30.0	82.6	18.3
Males	3.2	8.1	19.9	34.6	87.4	20.4
Females	2.5	5.4	12.9	24.8	77.8	16.1
1961						
HEART	.5	2.2	6.1	12.5	33.6	7.0
Males	.9	3.4	8.8	16.3	38.1	8.8
Females	.2	.9	3.3	8.8	29.4	5.2
CANCER	.5	1.5	3.7	6.4	11.4	3.2
Males	.4	1.4	4.2	7.9	14.0	3.6
Females	.6	1.7	3.3	5.1	9.1	2.8
ALL OTHER	1.2	2.1	4.7	9.3	31.4	6.4
Males	1.5	2.7	5.9	11.2	33.5	7.3
Females	.8	1.5	3.5	7.5	29.5	5.5
ALL	2.2	5.8	14.6	28.2	76.5	15.6
Males	2.8	7.4	18.9	35.3	85.6	19.7
Females	1.6	4.2	10.1	21.4	68.0	13.5
1971						
HEART	.4	1.8	5.1	10.4	30.6	6.1
Males	.7	2.9	7.9	14.8	36.3	8.1
Females	.2	.7	2.4	6.4	26.2	4.3
CANCER	.5	1.6	4.0	6.9	12.1	3.4
Males	.5	1.5	4.6	9.0	16.0	4.1
Females	.6	1.6	3.4	5.0	9.2	2.8
ALL OTHER	1.3	2.2	4.4	8.2	30.1	6.2
Males	1.7	2.9	5.7	10.8	35.1	7.5
Females	.9	1.5	3.1	5.9	26.2	4.9
ALL	2.3	5.5	13.5	25.5	72.8	15.7
Males	2.9	7.3	18.2	34.5	87.5	19.8
Females	1.7	3.8	8.9	17.3	61.6	12.1

TABLE B-37
(continued)

	AGE					Std
	35-44	45-54	55-64	65-69	70+	
1981						
HEART	.3	1.3	3.8	8.2	25.3	4.9
Males	.5	2.1	6.0	12.1	30.3	6.5
Females	.1	.5	1.9	4.8	21.8	2.6
CANCER	.4	1.6	4.1	7.1	12.5	3.4
Males	.4	1.6	4.9	9.0	17.1	4.3
Females	.5	1.6	3.5	5.5	9.2	2.8
ALL OTHER	1.0	1.8	3.4	6.9	25.0	5.0
Males	1.3	2.3	4.5	9.3	29.6	6.2
Females	.6	1.2	2.4	4.8	21.8	4.0
ALL	1.7	4.7	11.4	22.1	62.7	13.3
Males	2.2	6.0	15.4	30.3	76.9	17.0
Females	1.2	3.3	7.8	15.1	52.8	10.4

Data from 1951 to 1981 Vital Statistics and Census Data records.

Rates calculated by: ma = da/pa X 1,000 (where ma = rates, da = the sum of the frequency of deaths for age group a, and pa = the sum of the population for age group a). Generated through SPSSx.

Standard population: 1951, 35+, for Canada.

TABLE B-38

Standardized Death Rates(1) for Cardiovascular Disease (Per 1,000 Pop) for Ages 35+, by Year, Gender, Marital Status and Region

	1951	1961	1971	1981
GENDER				
Males	8.5	8.8	8.1	6.5
Females	5.8	5.2	4.3	2.6
MARITAL STATUS				
Single	8.1	7.9	6.8	6.1
Married	6.4	6.3	5.4	4.3
Widowed	7.9	7.3	6.6	5.4
Divorced	13.9	11.6	7.3	5.7
REGION				
Atlantic	6.1	6.6	6.4	5.4
Quebec	7.4	7.5	6.4	4.8
Ontario	7.8	7.6	5.5	5.1
Prairies	6.4	5.7	5.3	4.7
British Columbia	6.9	6.5	5.5	4.4
CANADA	7.2	7.0	6.1	4.9

(1) The rates in each age group are multiplied by the standard population (i.e., the population alive in Canada in 1951, by age group), and then divided by the total standard population.

Standardized rates are summarized from Tables B-32, B-35 and B-37.

TABLE B-39

Standardized Death Rates[1] for Malignant Neoplasms (Per 1,000 Pop) for Ages 35+, by Year, Gender, Marital Status and Region

	1951	1961	1971	1981
GENDER				
Males	3.2	3.6	4.1	4.3
Females	3.0	2.8	2.8	2.8
MARITAL STATUS				
Single	3.4	3.6	3.7	4.0
Married	3.0	3.1	3.3	3.4
Widowed	3.5	3.5	3.6	3.9
Divorced	5.0	5.6	4.4	4.7
REGION				
Atlantic	2.9	3.1	3.3	3.5
Quebec	3.6	3.7	3.9	3.6
Ontario	3.1	3.2	3.3	3.5
Prairies	2.9	2.9	3.1	3.2
British Columbia	2.9	3.0	3.2	3.2
CANADA	3.1	3.2	3.4	3.4

[1] For standardized rates, the rates in each group are multiplied by the standard population (i.e., the population alive in Canada in 1951, by age group), and then divided by the total standard population.

Standardized rates are summarized from Tables B-33, B-36 and B-37.